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In order to identify orientation and mobility skills essential for young blind children, a master list of skills was compiled from developmental studies and teachers' observations and formed into a scale comprised of 47 subscales, each of which had three or more items arranged in developmental order. Scaling was done by jury judgment and by full trial with the children and refined to 26 subscales which related to self-help in travel, formal orientation and mobility pre-cane skills, movement in space, use of sensory cues in travel, and directions and turns. A test-retest procedure with 41 subjects was used to test the reliability. Norming data was collected on 173 subjects, ages 3 to 12, who were representative of elementary age blind children. All were blind or had light perception only, and had normal intelligence and no physical disabilities which would interfere with orientation and mobility. Twenty-four test items which possessed an acceptable range of difficulty (20 to 80%) and a high reliability (.91 for the entire form) were used to construct a short form. The remaining promising items were used to construct instructional tasks in orientation and mobility for young blind children (34 items) and pre-cane orientation and mobility skills (25 items). Forty-four references, 11 tables, and the instruments are given. (Author/SN)

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PRELIMINARY STANDARDIZATION OF A SCALE OF ORIENTATION AND MOBILITY SKILLS OF YOUNG BLIND CHILDREN

AUGUST 1967

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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California State College at Los Angeles

Los Angeles, California

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Francis E. Lord

TABLE OF CONTENTS

CHAPTER I. INTRODUCTION 1

Objectives 2

Description of the Scale 2

Orientation and Mobility 4

Spatial Orientation 4

Framework or Models 5

Experimental Edition of Scales 8

  List of Subscales 10

CHAPTER II. RELIABILITY STUDY AND NORMING PROCEDURES 12

Data for Reliability Study 12

  Criteria for Selection of Cases 12

  Subjects 13

Examiners and Their Training 13

Testing Procedures 14

Data for Norming 15

Distribution of Subject by Type of Program 16

CHAPTER III. RELIABILITY STUDY AND NORMING DATA 18

Reliability and Norming Data 19

  Performance of Age Subgroups on the Selected Eighty-two Items 19

  Analysis of the Eighty-two Selected Items 23

    Sensory Cues 24

    Directions and Turns 24

Movement in Space 25

Self-help 27

Selecting Items for the Short Form 28

Items Included in the Short Form 29

Directions and Turns 29

Movement in Space 29

Self-help 30

Characteristics of the Short Form 30

Reliability 30

Retest Effect 32

Correlation of Performance with Age 33

Directions and Turns 34

Movement in Space 34

Self-help 35

Comparison of Blind and Light Perception Subjects 38

Intercorrelations among Subscales 40

Distribution of Scores on Short Form 40

CHAPTER IV. SUMMARY, INSTRUMENTS AND RECOMMENDATIONS 42

Summary and Instruments 42

Background 42

Experimental Edition 42

Reliability 43

Norming data 43

Instruments Produced 44

Recommendations 45

Relating to Research 45

Specific Recommendations Relating to the Instruments 46

References Cited 48

APPENDIX A. Selected References

APPENDIX B. Experimental Edition of the Orientation and Mobility Scale

APPENDIX C. Distribution of Subjects by Type of Program

APPENDIX D_1. Distribution of Responses on all Items for Each Age Level

APPENDIX D_2. Percentage of Success by Age Groups for Eighty-two Selected Items which were passed by 20-80 Per Cent of the Children at One or More Age Group

APPENDIX D_3. Reliability Coefficients by Age Groups for the Eighty-two Selected Items

APPENDIX E. Instruments Resulting from the Project

Part I. Orientation and Mobility Scale for Young Blind Children, Short Form - Experimental Edition.

Part II. Instructional Tasks in Orientation and Mobility for Young Blind Children, With Standardized Instructions and Scoring.

Section A. Pre-cane skills

Section B. General Orientation and Mobility Tasks

Part III. Age Norms for Twenty-four Items in the Short Form

APPENDIX F. Suggested Additional Items

APPENDIX G. Summary of Field Examiner's Notes on Specific Items

General Suggestions for Order of Administration of the Items

ERIC RESUME

LIST OF TABLES

Table		Page
I.	Characteristics of Subjects in the Reliability Study	13
II.	Distribution of Subjects by Age, Sex, and Amount of Vision	16
III.	Distribution of Cases Between Day School, Residential, and Pre-school Programs	17
IV.	Tentative Age Norms for Eighty-two Selected Items listed in Appendix D-2	20
V.	Reliability Coefficients for Short Form	31
VI.	Correlation Between Success on Individual Items and Total Score on the Short Form Scale	31
VII.	Re-Test Effect on Sub-Scales of the Short Form	33
VIII.	Correlation of Short Form Items and Scales with Chronological Age as well as Correlations of Additional Items with Reliability Coefficients Above .40	33
IX.	Comparison of Performance of Blind Subjects and Subjects with Light Perception on Items of the Short Form	39
X.	Intercorrelation of Subscales of Short Form	40
XI.	Distribution of Short Form Scores by Age Groups	41

CHAPTER I

INTRODUCTION

The inability of the blind to move freely in space constitutes one of their chief limitations. The competent blind person, however, learns many skills which help reduce the significance of this limitation. The sighted person is able visually to survey both near and distant space, noting landmarks and spatial relationships; the blind person limits his survey to objects within reach and to those nearby objects that provide distinguishing cues, such as sound, for identification and localization. The blind person is obliged to use a variety of cues and to develop patterns of behavior which compensate for his loss of vision. The use of such cues and the employment of related skills has come to be referred to as "orientation and mobility." The term may be defined more formally as including the adjustments and skills necessary for effective interaction of the blind person with his total environment, e.g., sensory perception, mental orientation or cognitive mapping, and locomotion.

Orientation and mobility instruction, which has developed in recent years, has been employed to assist blind adults in managing their environment more effectively. More recently, such instruction has been extended to blind children of secondary and even elementary school ages. However, little research is available to serve as a guide to the specialist in making this application.

The first phase of this project had for its purpose the identification of orientation and mobility skills related to the developmental tasks of young blind children, ages three through twelve (6). A review of developmental studies of normal as well as blind children provided the primary sources for initial identification of these skills. Experienced teachers of blind children contributed their lists of competencies, abilities, and skills needed in working effectively in the school environment. A master list of skills relating to orientation and mobility was compiled from all these sources. The project staff, with the assistance of a professional jury, arranged the selected skills into a set of forty-two scales. Each scale contained three or more items (subscales) which were arranged in terms of jury judgments on their developmental sequence. The validity of jury-ordering of skills within each subscale was checked against the actual performance ratings of a small sample of blind children. The project culminated in a preliminary draft of a set of forty-two subscales which related to orientation and mobility skills of young blind children. The following is an example of one of the subscales:

USING RIGHT AND LEFT

1. Distinguishes right and left on own body.
2. Responds correctly to a command to turn right or left.
3. Uses right and left consistently as an aid to travel.
4. Distinguishes right and left in the environment.

The review of research relating to orientation and mobility of blind children was presented in detail in the report of the initial project or Phase I (6). Selected references which are especially pertinent to the project being summarized here have been reproduced in Appendix A.

Objectives

The objectives of this Project (Phase II) of the study of orientation and mobility skills of young blind children were as follows:

1. To revise the preliminary draft of the orientation and mobility scales which were developed in Phase I. The revision is hereafter referred to as the Experimental Edition.
2. To prepare a detailed manual for use in administering the scales.
3. To submit the Experimental Edition to a reliability study.
4. To establish preliminary norms for the Experimental Edition.

Description of the Scale

There are many approaches to scale construction and, consequently, the staff which undertook this project devoted a great deal of attention to considering the approach which seemed most fruitful for the task at hand. Since there have been such limited previous attempts to develop measures of orientation and mobility skills, little help has been available from other sources. Measurement problems are difficult since the field is very complex, involving maturational skills, self-taught skills, and some very formal skills which are taught as a part of orientation and mobility training by specialists.

The development of a simple three or five point rating scale which describes frequency with which skills are employed did not seem advisable as an initial effort. Such scales are somewhat subjective and also fail to give an objective emphasis to the progressive or developmental character of many skills. It seemed advisable at this initial stage of research to develop a scale which would provide as much information as possible on the developmental aspect of each major skill. It was believed that the greatest contribution could be made by identifying all major skills, dividing a major skill into sub-skills, and then developing items for each sub-skill.

A comprehensive scale which can be used to reveal actual attainments or level of performance of blind children should be helpful for research purposes. Also, such a scale can be used to supply data which can be used to construct additional instruments.

It also seemed advisable, in this initial effort to develop a scale, to concentrate upon an instrument for young children, since many of the skills should be developed during childhood. Therefore, the scale was projected for use with school-age children under twelve. The preschool years were included primarily as a base for the school age child. The projected scale was not designed to provide an adequate measure for the skills at the preschool level.

The preliminary edition of the scale comprised a total of forty-two subscales consisting of a total of 288 items. Data from a limited field trial revealed that thirty-three of these subscales met the criteria for scalability sufficiently well to warrant consideration for inclusion in the Experimental Edition. After extensive review by the staff, certain subscales were combined, while others were eliminated due to lack of objectivity in scoring and/or difficulty of administration. The Experimental Edition consisted of the following twenty-seven subscales:

1. Seating Self
2. Familiarization Techniques
3. Using Tactual Cues
4. Walking
5. Using Direction Taking
6. Using Search Pattern
7. Using Doors and Windows
8. Using Right and Left
9. Identifying Parts of Body
10. Putting on Clothing
11. Removing Clothing
12. Understanding Turns
13. Using the Telephone
14. Handling Simple Tools - Materials
15. Auditory Cues-Localization
*16. Auditory Cues-Identification
17. Auditory Cues-Travel
18. Using Sighted Guide
19. Using Trailing Techniques
20. Reversing Routes
21. Entering - Leaving Auto
22. Cardinal Directions
23. Walking Up-Down Steps
24. Hopping and Skipping
25. Running
26. Jumping
27. Climbing

* Subscale 16 was dropped early in the study because it proved to be too easy.

Orientation and Mobility

The field of orientation and mobility for the blind has just recently emerged as a defined area of instruction. Unfortunately, there is little significant research relating to such fundamental problems as travel needs, practices employed by good travelers, actual skills required, an analysis of each of the several skills employed, relative effectiveness of different types of cues, range of individual differences with respect to ability to master certain skills, etc. The absence of basic research relating to such matters presents formidable problems to those who wish to design instruments for measuring the child's status and/or progress.

Since the field of formal orientation and mobility instruction is so new, it seems appropriate to examine some of the major concepts involved. While our analysis is incomplete and limited to only a few phases of the process, it is hoped that these limitations will stimulate others to extend the analysis.

Spatial Orientation

Spatial orientation as a psychological process relates to the localization of objects in some "frame of reference" (a) with reference to oneself, (b) to another person or to a fixed object, or (c) in terms of a cognitive map expressed in terms of standard directions. It has been assumed, and perhaps demonstrated in part, that the genetic development of orientation follows a series of stages which approximates the order in which these three phases were just enumerated. It is apparent that most children do not acquire efficient habits at the highest level, i.e., use of standard coordinates and directional terms.

Methods

Trowbridge (11) has differentiated between what appears to be two radically different methods of orientation. He points out that one is used by civilized man while the other is used chiefly by members of primitive societies. The advanced method employs the points of the compass and embodies the cardinal directions. In this case, objects have directional relationships with each other or to a frame of reference expressed in terms of conventional directions. The primitive method is characterized by directional relationships which are expressed in terms of the position of the individual without respect to the conventional system of compass points. Within this system, locations are interrelated to the self, body position, turns, etc. No doubt children who do not possess a knowledge of cardinal directions employ this method except, perhaps, they form a cognitive map of interrelationships of objects, e.g., play area is behind the house, etc.

Directionality

Child development specialists have given major consideration to the development of laterality and directionality. Kephart (5), whose primary interest has been to apply such findings to training programs for children, describes the development of directionality as follows:

> When the child has developed laterality within his own organism and is aware of the right and left sides of his own body, he is ready to project these directional concepts into external space. By experimenting with movement patterns directed toward objects in space, he learns that to reach an object he must make a movement, for example, to the right. He then reverses this deduction and develops the concept of an object to the right of himself. Through a number of such experiences, he learns to translate the right-left discrimination within himself into a right-left discrimination among objects outside himself.
>
> Experimenters in the field of child development have consistently noted that spatial relationships and spatial directions develop first in relation to the child himself and only later are objective relations developed between objects. Thus, early in his development, a child locates two objects, each independently in relation to himself. This has been called egocentric localization or the development of subjective space. Later in development, he is able to conceive of one object to the right of another without the intervening step of locating each object with relation to himself. This later development has been called objective localization or the development of objective space. Piaget (1956), Gesell (1940), and others have outlined this developmental sequence. (p. 46) *

Framework

No well-developed model or theoretical framework seems to be available for use in structuring the field of orientation and mobility. The two following constructs or models are proposed in an attempt to establish a tentative framework for viewing the field.

* Reprinted from The Slow Learner in the Classroom, by Newell C. Kephart, by permission of Charles E. Merrill Books, Inc. Copyrighted, 1960.

Model 1. This model presents an analysis based upon environment control. The blind child is viewed as operating in an environment which comprises a number of elements. His own resources must be called into play to interpret this environment as a basis for managing himself and meeting his needs in the environment. As he employs his resources in environment management, he develops a great variety of skills. These skills become the patterns of behavior commonly referred to as orientation and mobility. The outline of this model may be portrayed graphically as follows:

ORIENTATION AND MOBILITY MODEL BASED UPON ENVIRONMENT CONTROL

Environment (types of stimuli)	Individual Resources	Knowledge and Skills
Fixed objects	General intelligence, judgment, sense of hearing, aptitude in interpreting spatial relationships	Locomotion skills
Moving objects		Sensory discrimination and percepts
Spatial Relations between objects	Tactual sense	Spatial concepts
Variations in textures	Sense of smell	Object concepts
Variations in temperature, moisture, air currents	Sensitivity to kinesthetic cues	Cognitive mapping or development of "objective space"
Variations in sound	Cutaneous Awareness	Time/Space judgments (such as units of time, velocity, etc.)
Time as a sequence of events; time as a duration		
Psychological stimuli (e.g., tones of voice)		

Model 2. One can also view the field of movement in space by the blind as a sensory orientation process. It is the senses which first come in contact with the environment and which serve as the controlling force. Environment control relates to and develops from the capacity of the individual to employ the senses effectively.

ORIENTATION AND MOBILITY MODEL BASED UPON SENSORY CAPACITY

Sensory Capacity	Environment Dimensions	Orientation and Mobility Skills
Auditory	Distance	Using sound cues and other sensory cues
Tactual	Direction	Judging distance
Kinesthesia	Elevation and other spatial relationships	
Olfactory		Estimating space relationships
Cutaneous sense	Sound	Locomotion skills
	Textures	Reaching, use of arms, making finer tactual distinctions through exploratory use of fingers
	Time	
	Temperature	
		Developing "images" of objects which can be recalled in response to "word cues"

Lord (7) investigated the ability of sighted elementary age children in Grades V-VIII to use cardinal directions in a variety of ways. Approximately seventy-five per cent of the children could point out the four cardinal directions accurately. They were a little less efficient in indicating the four major intermediate directions. Less than a third of the children were able to point in space toward the location representing major cities. Evidence has been presented to show that children do not have a well-generalized notion of the cardinal directions. They may, for example, identify south and east but fail to identify southeast. However, when asked to point out locations of cities in space they are frequently fairly accurate, especially with nearby cities.

The direction the subjects face while taking the tests is an important factor in their success. Subjects who faced north during the tests were distinctly superior, while subjects who faced south were less accurate and exhibited incorrect "imaginary maps."

One can conclude that children do not know directions, they compute them. That is, if a child were asked to point northeast, he is likely to respond by calculating much as if he were asked to add two numbers. He is likely to say, "There is north (pointing), there is east, so northeast is there."

Experimental Edition

A number of desirable revisions of the Preliminary Edition of the Scales was indicated by the results of the limited field trials in 1966. Some subscales lacked internal consistency; some items involved more than one skill and hence posed problems of scoring; still others involved the use of variable cues, and hence the child's performance could not be interpreted objectively. Aside from the problems relating specifically to scale construction, a number of practical problems presented themselves. Each of these problems will be discussed briefly at this point.

Special Problems

Inclusion of taught skills. Orientation and mobility instruction includes a number of specific skills which are taught at appropriate ages, e.g., search pattern, trailing, etc. A child's performance on these skills is dependent upon the timing and efficiency of such instruction, as well as upon how well the child has retained the skill. Performance with reference to such skills is less correlated with age than are the many skills which develop largely as a result of maturation and self-imposed practice, e.g., walking, jumping, climbing stairs.

It was the original desire of the investigator and research team to base the scale primarily upon skills which were related to developmental tasks. However, formal instruction in orientation and mobility does provide a series of new and/or substitute skills which have unique importance for the blind. The blind child learns to walk with little difficulty, but as he walks in unfamiliar places, he must employ some specially taught skills to assure reasonable safety, e.g., trailing, holding forearm across the body, etc. Since these orientation and mobility skills become important auxiliary aids for the blind, it is important to include them in an instrument which assesses the child's ability to manage himself in space.

It was recognized that not many blind children in the norming sample would have had formal instruction relating to these recognized orientation and mobility skills. Nevertheless, it seemed important to collect data regarding the ability of children who have had orientation and mobility training to recognize the appropriateness of these skills and use them as needed in everyday situations. Consequently, there were included five subscales on orientation and mobility skills which are recognized in the teaching schedules of mobility instructors. These skills are commonly referred to as the basic skills in orientation and mobility instruction and appear in the scales with the following titles: Familiarization, Using direction-taking, Using search pattern, Using sighted guide, Using trailing techniques.

Living skills. Instruction in living skills has been incorporated in formal orientation and mobility training. Examples of such skills are eating, dressing, shaking hands, etc. While it was recognized that these skills have vital implications for managing oneself in relation to travel, choice had to be made as to the number of such skills which might be included and at the same time keep administration time within reasonable limits.

Since living skills are featured in other instruments (1,2,8) only selected living skills were included in the orientation and mobility scales. Skills were selected which had some direct bearing upon managing oneself in a school environment. Eating skills were excluded due to difficulties of standardizing the test situation and the extensive time required to test the ability. The following living skills were included in the scale: seating oneself, putting on clothing, removing clothing.

Preschool skills. It was recognized that early instruction of preschool blind children in some aspects of orientation and mobility is imperative. Although the scale planned in this project was intended primarily for school-age children, some subscales do include preschool items. These items are included primarily to provide an adequate floor for school-age children, i.e., to provide a basis for assessing the skills of blind children who have had little preschool assistance.

Objectivity of items. Special difficulties were encountered in maintaining adequate objectivity and validity in scoring certain of the items involving the child's use of cues. Many of the cues used by the blind are multiple in nature. A child's performance in a specific task may be guided by one or more of several cues. A blind child may follow a sidewalk by using a guideline in the terrain or by sound from parallel traffic or other cues. A child may detect the presence of a large building by use of auditory cues (echo), air currents or, in some instances, sunlight or shade. Hence, it is very difficult for an examiner to determine which of the several cues the child may be using or which is the dominant cue in a specific situation. Such scoring problems lowered the reliability of some items, as shown in the tables of reliability coefficients in a later chapter.

Comparability of conditions for testing. For convenience of administration most of the items have been designed to use situations in the child's immediate environment, usually the school and playground. The many variations from school to school in the physical environment for testing presented serious problems of comparability. For example, the size of the examining rooms vary; hence, there were wide variations in the opportunities afforded different subjects to explore the room (Subscale 2). Sound cues from traffic along a street vary in intensity and duration; therefore, they do not provide comparable situations as one attempts to assess the child's ability to use such cues in establishing a line of travel.

The ability to use temperature cues, air current cues and olfactory cues in life situations is very important for the blind. However, the difficulties of constructing items which could be objectively scored were almost insuperable.

Levels of assistance. In structuring some items a minimum level of assistance or staging by the examiner seems appropriate or defensible, provided that such assistance was clearly defined in the manual. The staff recognized that assistance could be either verbal or manual (such as positioning the child or placing the child's hand on the back of the chair). The following levels of assistance were defined:

1. Manual assistance - e.g., positioning of the subject

2. Verbal assistance - e.g., "The first step of the stairs is just ahead of you."

List of Subscales

The subscales of the Experimental Edition were arranged in an order convenient for administration; for example, items which were administered indoors were grouped together. Likewise, items which required an outdoor setting were arranged in a convenient order with reference to the use of physical facilities.

The subscales in the Experimental Edition may be grouped around the following major activities or major competencies:

Scales which relate primarily to self help

1. Seating oneself
10. Putting on clothing
11. Removing clothing
13. Using the telephone
21. Entering - leaving auto
14. Handling simple tools - materials
9. Identifying parts of body
7. Using doors and windows

Scales which relate primarily to formally taught orientation and mobility skills

2. Familiarization
6. Using search pattern
5. Using direction taking
19. Using trailing techniques
18. Using sighted guide

Scales which relate primarily to habitual movements in space

4. Walking
23. Walking up and down steps
24. Hopping and skipping
25. Running
26. Jumping
27. Climbing

Scales relating primarily to the use of sensory cues in travel

3. Using tactual cues
15. Auditory cues - localization
16. Auditory cues - identification
17. Auditory cues - travel

Scales relating primarily to directions, turns

8. Using right and left
12. Understanding turns
20. Reversing routes
22. Cardinal directions.

The field edition of the experimental scales is reproduced in Appendix B, including the instructions to the examiners, the glossary being part of the instructions.

CHAPTER II

RELIABILITY STUDY AND NORMING PROCEDURES

The Experimental Edition of the Scale was subjected to a reliability study in order to determine its objectivity with reference to administration and scoring. Since criteria for selection of subjects and testing procedures were the same for the reliability study and the norming, both processes are described in this section of the report.

Data for the Reliability Study

Criteria for Selection of Cases

Most studies in special education are based upon heterogeneous populations, such as all degrees of blindness, physical handicaps which vary in degree, and type of orthopedic impairment. It was desired in this study to employ subjects who constituted as homogeneous a population as possible. Consequently, special attention was given to the amount of sight possessed, as well as other handicapping conditions. The following criteria were established for the selection of cases for the reliability study and also for the norming data:

Chronological Age. All cases must be between the ages of three and twelve. The items on the Scale were designed to measure basic skills relating to orientation and mobility; it was assumed that an emphasis on instruction of young children would constitute the most worthwhile initial step in measurement. Furthermore, the scales relate only to selected pre-cane skills, the cane ordinarily not being introduced until the child reaches secondary school.

Sex Ratio. The sex ratio should approximate that of blind children generally, i.e., roughly fifty per cent male and fifty per cent female. While survey figures vary somewhat regarding sex ratio, they consistently report a slightly higher ratio of males.*

School Conditions. The ratio of children in day versus residential schools should approximate the prevailing enrollment pattern, i.e., one-third residential school and two-thirds day school (7). All children should be enrolled in established preschool programs or in school programs for the legally blind. If a program had been in operation for at least five years, it was classified for our purposes as an "established" program.

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* The American Association of Instructors of the Blind, Inc., reported the ratio of males to females, ages 5-19, to be 63 per 100,000 to 50.4 per 100,000. (Private correspondence)

Functioning Ability. The intellectual and functioning levels of all cases included should be typical of the normal range of functioning in the blind population. This standard was interpreted to mean an intelligence level of approximately eighty-five or above. If an intelligence rating was not available, the classroom teacher was asked to indicate whether, in her judgment, the subject referred possessed an intelligence rating within the normal range. The child must be free from other physical handicaps, such as hearing or motor ability, which might limit orientation and mobility. The child must not manifest an emotional disturbance which might invalidate test results or might interfere with his general motivation or capacity to move about and participate in activities normal for his age.

Subjects

The subjects for the reliability study were enrolled in either public day school programs in California or in programs for preschool children. The majority of the subjects was in programs in Southern California. The distribution of subjects according to age is presented in Table I, below.

TABLE I

AGE DISTRIBUTION OF SAMPLE FOR RELIABILITY STUDY

Age Group	Number
3-4	2
5-6	8
7-8	8
9-10	8
11-12	15
Total	41

Examiners and Their Training

Two staff members, the Chief Examiner and the Field Examiner, administered all tests in the study. The former was an experienced teacher of the blind who had assisted with the preparation of the scales and had administered the Preliminary Edition of the Scale to twelve children during Phase I of the Project. The Field Examiner, who joined the staff during the year, is a psychometrist with a Master's Degree in School Counseling. She has had previous experience in psychometric testing of the blind and was on leave from a school which served blind youth where she had been employed for eight years. Prior to data collection for the reliability study, the Field Examiner went through extensive training in the administration and scoring of the scales. The training period was structured as follows:

> Observation Period. The Field Examiner (hereafter referred to in this chapter section as Trainee) observed the administration of the Scale with fourteen cases who varied in age from five to twelve. During the observation the Trainee scored all responses independently.
>
> The Chief Examiner and the Trainee held daily conferences and discussed their uncertainties with respect to the scoring of specific items which seemed troublesome. The discussions were, however, restricted to procedures for administration and bases for scoring and did not relate to scoring decisions made with respect to responses of individual children.
>
> Practice Period. After the Trainee had completed the observation period, she was assigned cases for individual practice while the Chief Examiner observed. A total of five cases, ages three to twelve, were used for this supervised practice period. Again, conferences were held to clarify problems relating to procedures for administration and scoring.

Testing Procedures

The examiners planned the testing schedule so that each examiner gave the initial test to approximately fifty per cent of the cases and the re-test for the remainder. (Examiner A tested nineteen cases; Examiner B, twenty-six.)

Since all cases available at each center were tested, no special procedures, such as randomization, were necessary to avoid sampling bias.

An interval of at least two days occurred between test and re-test, with the exception of two cases which had to be re-tested the next day. In no case did the interval between tests exceed twenty-one days.

Each examiner maintained a case record for each subject's attitude, adequacy of testing situation, observations relating to the objectivity of scoring, and the like. A copy of the Examiner's observational record form has been included in Appendix B.

The examiners systematically recorded their observations on the score sheets with respect to certain designated items, e.g., type of terrain used in Item 3.4; reason for failing, Item 13.2; method used by child in discovering which way the car faced in 21.1; etc. It was thought that these comments might provide helpful data for interpreting the findings on children's performance on these items.

Data for Norming

The criteria which were described in the section relating to the reliability study were applied to the selection of subjects for norming data as well. All subjects were either totally blind or possessed light perception only. All subjects were judged to be of average or higher intelligence and did not possess other handicaps which might interfere with the acquisition of orientation and mobility skills.

The criteria relating to the restriction as to amount of vision were intended to limit the sample to children who do not have sufficient sight to provide an aid in travel. It can be assumed that such children have the greatest need for training in orientation and mobility. Also, all children who met criteria relating to blindness but who possessed any other physical limitation or were judged to be retarded or disturbed were excluded from the sample. The rigid criteria relating to the amount of vision and other handicapping conditions resulted in screening out a large proportion of legally blind children who were attending public school classes or receiving services for preschool children. For example, the Southern California roster of blind preschool children contains twenty-five cases between the ages of three and six. However, only seven of these cases met the full criteria designed for the subjects in this study. The Frances Blend School for Blind Children, Los Angeles City Schools, had 123 pupils enrolled between the ages of five and twelve. Only seventeen of these children met the criteria of this study.

The distribution of the 173 subjects according to age, sex, and amount of vision is shown in Table II. The sex ratio of eighty-six boys and eighty-seven girls approximates the reported distribution found in the school population. There were 109 subjects who were blind and sixty-four who possessed light perception or light projection. Within the group of 173 subjects are the forty-one subjects used in the reliability study. In all cases, the results for the initial test were used for norming data. The inclusion of such cases in the norming groups was motivated by the great difficulty encountered in finding children who met the high criteria.

TABLE II

DISTRIBUTION OF SUBJECTS BY AGE GROUPS, SEX, AND AMOUNT OF VISION

Age Groups	Blind		Light Perception		Total
	M	F	M	F	
3-4	9	4	1	3	17
5-6	11	12	4	6	33
7-8	11	13	10	9	43
9-10	13	13	4	10	40
11-12	15	8	8	9	40
Total	59	50	27	37	173

Distribution of Subjects by Type of Programs

The subjects for the norming data were selected from representative preschool programs and from day and residential schools on the West Coast, the Midwest, and the East. All schools had well-established programs, and the preschool services were on-going programs under professional supervision. The subjects were selected from a great variety of programs in the United States. Twenty day school programs were included in the sample, as well as subjects from eight residential schools and preschool children from services located in seven different states. In some centers only the younger children were tested, since it was difficult to locate such cases. However, all children within a particular age group who met the criteria were tested in such centers. Consequently, there was no problem of selection among qualified subjects. A list of all programs and the number of children tested is reported in Appendix C.

The distribution of subjects among the several types of school programs is shown in Table III. It will be noted that the preschool children were being served in one of three ways: (a) home service by a preschool counselor, (b) a preschool nursery in a day school setting, and (c) a nursery or preschool in a residential setting.

TABLE III

DISTRIBUTION OF CASES BETWEEN DAY SCHOOL, RESIDENTIAL, AND PRESCHOOL PROGRAMS

Type of Program		Number of Cases
Day Schools		88
Residential Schools		52
Preschool Programs (Children under 6):		33
Day	(9)	
Residential	(4)	
Home Service	(20)	
	Total	173

CHAPTER III

THE RELIABILITY STUDY AND NORMING DATA

Several critical problems relating to objective measurement of orientation and mobility skills were presented in Chapter I. The chief problems related to (a) subjectivity attributable to inability of the examiner to be sure of the particular cue or cues being used by the subject; (b) lack of comparability of conditions for testing, e.g., rooms may vary in size, cues may vary in kind and intensity; and (c) subjectivity arising from difficulty in defining criteria (e.g., a relaxed gait). The staff was aware of these problems while the instrument was under construction and revision. They attempted to minimize the influence of such factors by wording items precisely, defining terms used, describing test situations carefully, and providing clear and precise standards of scoring.

During the testing of the norming sample, the examiners met several recurring problems which have special significance for measurement in this field. These problems indicate the difficulty of obtaining an objective evaluation of the performance of blind children and those having only light perception. In this chapter section the term "blind children" is used to include both these groups.

(a) Blind children have difficulty in pointing with the hand in a manner which can be clearly interpreted by an observer. This limitation might be expected since a visual referent is very helpful in pointing. There seems to be some advantage to having a blind child point by facing or "pointing with his nose", rather than by use of the hand.

(b) Blind children are frequently unaware of the precise cues which they use as an aid in the performance of a skill. Although a child uses auditory cues often, he might not be aware at the moment that these cues were important referents.

(c) Blind children show considerable fear of moving in space, e.g., in running and jumping. Even though the child is assured that no obstructions are in his path, he tends to inhibit such movement patterns.

(d) It is difficult for the blind child to describe the function of tools, door hinges, etc., since he, unlike sighted children, has not had the experience of repeated observation of the action involved in using the tool. Again, the absence of the visual referent imposes serious limitations on the range and depth of common experiences.

Performance data were obtained on one hundred seventy-three subjects who constituted a homogeneous and representative population of blind children between the ages of three and twelve years. Forty-four (44) of these subjects were tested by both examiners to estimate the reliability of the scale.

Data were obtained which provided a basis for tentative norms for those items which proved to have at least a minimal effectiveness in the field (in the sense that the item was passed by 20-80 per cent of the children in one or more of the five age groups studied).

Reliability and Norming Data

The distribution of responses on each item of the Experimental Edition is given in Appendix D1 for each of the five age levels. The frequency of each type of response (pass, fail, no opportunity) is shown for each of the one hundred twenty-four items which were administered.

Eighty-two (82) of the one hundred twenty-four items of the Experimental Edition of the scale which passed a minimal effectiveness criterion were selected for special study. These eighty-two items were passed by 20-80 per cent of the subjects at at least one of the five age levels: (3-4), (5-6), (7-8), (9-10), and (11-12). The range of passing at the 20-80 per cent level was chosen in order to eliminate items which were either too easy or too difficult to have value as measurement tasks. The percentages of success by age groups, along with these reliability coefficients for the total group are reported in Appendix D2 for each of the eighty-two items. Performance data for the particular age groups for which an item will function fairly effectively, i.e., within the 20-80 per cent range, have been underscored. The underscoring calls attention to the age levels at which an item may be judged to have satisfactory difficulty.

The reliability coefficients by age groups for the eighty-two selected items are presented in Appendix D3.

Performance of Age Subgroups on the Selected Eighty-two Items

Table IV presents tentative age norms for the eighty-two selected items. The range of difficulty of the eighty-two items (which had been previously identified as potentially useful) was

TABLE IV

TENTATIVE AGE NORMS FOR EIGHTY-TWO SELECTED ITEMS LISTED IN APPENDIX D2

Items	Age Groups				
	3-4	5-6	7-8	9-10	11-12
Items passed by a majority of children ages 3-4					
3.2	>50%	>75%	>90%		
3.3	>50%	>90%			
3.4	>50%	>90%			
4.5	>50%	>50%	>50%	>25%	>25%
11.1	>50%	>75%	>90%		
11.3	>50%	>90%			
12.2	>50%	>90%			
12.3	>50%	>75%	>90%		
13.2	>75%	>90%			
15.1	>75%	>50%	>50%	>75%	>75%
17.4	>50%	>90%			
25.3	>75%	>75%	>90%		
27.3	>50%	>75%	>75%	>90%	
27.4	>50%	>75%	>75%	>90%	
Additional items passed by a majority of children ages 5-6					
2.3	>25%	>50%	>90%		
3.1	>25%	>75%	>90%	>75%	>90%
3.5	>10%	>75%	>75%	>90%	
3.6	<10%	>50%	>50%	>75%	>75%
4.4	>25%	>50%	>25%	>50%	>50%
7.6	>25%	>50%	>75%	>75%	>75%
8.1	>25%	>90%			
8.2	>10%	>75%	>90%		
8.5	>25%	>75%	>75%	>90%	
9.3	>25%	>50%	>90%	>75%	>90%
9.4	>25%	>50%	>50%	>50%	>50%
10.2	<10%	>50%	>75%	>90%	
10.3	>10%	>50%	>75%	>90%	
11.2	>25%	>50%	>90%		
11.5	>10%	>50%	>90%		
12.1	>25%	>75%	>90%		
14.1	>25%	>50%	>50%	>75%	>75%
14.3	>25%	>50%	>75%	>75%	>75%
14.4	>25%	>50%	>90%	>75%	>75%
15.2	>25%	>50%	>50%	>90%	
17.1	>10%	>50%	>50%	>75%	
17.2	>25%	>90%			
17.3	>25%	>50%	>90%		

Table IV Continued

Items	Age Groups				
	3-4	5-6	7-8	9-10	11-12
19.1	>10%	>50%	>90%		
20.1	>25%	>50%	>75%	>90%	
20.2	>25%	>50%	>75%	>75%	>90%
23.2	>25%	>50%	>75%	>90%	
23.3	>10%	>50%	>75%	>90%	
23.4	>25%	>50%	>75%	>75%	>75%
24.1	>10%	>50%	>75%	>90%	
26.2	>25%	>75%	>90%		
26.3	>10%	>50%	>75%	>90%	>75%
26.4	>25%	>50%	>50%	>75%	>75%
Additional items passed by a majority of children ages 7-8					
7.3	>10%	>25%	>50%	>50%	>50%
7.4	>10%	>25%	>50%	>50%	>50%
7.5	<10%	>25%	>50%	>50%	>75%
8.3	<10%	>25%	>50%	>50%	>75%
10.4	<10%	>25%	>50%	>75%	>90%
10.5	<10%	>25%	>50%	>75%	>75%
12.4	<10%	>25%	>50%	>50%	>50%
21.1	>25%	>25%	>50%	>75%	>75%
23.5	>10%	>25%	>50%	>50%	>75%
24.2	>10%	>25%	>75%	>75%	>90%
24.3	>10%	>25%	>50%	>50%	>50%
24.4	<10%	>25%	>50%	>50%	>50%
Additional items passed by a majority of children ages 9-10					
2.4	<10%	>25%	>25%	>50%	>25%
7.7	<10%	>10%	>25%	>50%	>75%
8.4	<10%	>10%	>25%	>50%	>50%
10.7	<10%	>10%	>25%	>50%	>75%
13.4	<10%	<10%	>25%	>50%	>50%
14.5	<10%	>25%	>25%	>50%	>50%
20.3	>10%	>25%	>25%	>50%	>50%
20.4	>10%	>25%	>25%	>50%	>50%
Additional items passed by a majority of children ages 11-12					
15.3	<10%	>10%	>10%	>25%	>50%

Table IV Continued

Items	Age Groups				
	3-4	5-6	7-8	9-10	11-12
Items passed by less than a majority of all age groups					
2.2	<10%	<10%	<10%	< 10%	>10%
4.6	>25%	>25%	>25%	>25%	>25%
17.5	<10%	>10%	>10%	>25%	>25%
18.1	<10%	<10%	<10%	>10%	>25%
18.2	<10%	<10%	<10%	10%	>25%
18.3	<10%	<10%	<10%	<10%	>10%
18.5	<10%	<10%	<10%	<10%	>10%
18.8	<10%	<10%	<10%	>10%	>25%
19.2	<10%	<10%	<10%	<10%	>10%
19.3	<10%	<10%	<10%	>10%	>25%
22.1	<10%	<10%	<10%	>25%	>25%
22.2	<10%	<10%	>10%	>10%	>25%
22.3	<10%	<10%	<10%	>25%	>25%
25.4	<10%	>25%	>25%	>25%	>25%

very marked. Some items were passed by 75 per cent of the youngest subjects (ages 3-4), while other items were passed by less than 25 per cent of the older subjects (ages 11-12). Tentative norms were computed for each of the eighty-two items under consideration by reporting the percent of children at each age level who could successfully perform the task.

The eighty-two items presented in Table IV have been grouped according to the age level at which the item was first passed by a majority of children. As the following distribution shows, these items tend to be most useful for children of ages 3-8. Many children of age 9 and above, however, can be effectively measured by these scales if they tend to be immature with respect to their development of the skills measured.

Items passed by a majority of children ages 3-4	14 items
Additional items passed by a majority of children ages 5-6	33 items
Additional items passed by a majority of children ages 7-8	12 items

Additional items passed by a majority of children ages 9-10	8 items
Additional items passed by a majority of children ages 11-12	1 item
Items passed by less than a majority of children of all age groups	14 items

Analysis of the Eighty-two Selected Items

The eighty-two items which passed the first criterion of minimal effectiveness are listed in Appendix D2 and arranged in order of "average per cent passed" in the five age groups combined.

These eighty-two items are classifiable as follows:

Orientation and Mobility Items (taught in O-M programs)	11 items
Sensory Cues	14 items
Directions, Turns	16 items
Movement in Space	18 items
Self-Help	23 items

All of these items which have reasonably satisfactory reliability for use in group comparisons are worthy of further study and revision.

Since it is premature to analyze the statistical data on reliability and norming data on Orientation and Mobility items in advance of the development of instructional programs at the elementary school level, the staff agreed that their chief contribution in this area had been the careful description of the tasks and scoring standards. These items were given no further study. In each of the other areas listed above, however, several items can be identified as ones which might well be combined for experimental use in studies of programs designed to assist children to progress with respect to: Sensory Cues, Directions and Turns, Movement in Space, Self-Help, or some combination thereof. Such use would provide additional data regarding the reliability and construct validity of the items.

Sensory Cues. Of the fourteen items on sensory cues in Table IV, seven had reliability coefficients of .30 or higher. They are listed below, in order of difficulty, or "Average per cent passed." Check marks (x) indicate the age groups for which the item satisfies the criterion of 20-80 per cent passing; i.e., the age groups in which the item may differentiate with at least minimal effectiveness within the age grouping.

	Reliability Coefficient	Av. % Passed (ages 3-12)	Age Groups				
			3-4	5-6	7-8	9-10	11-12
3.4 Makes discriminations between objects of similar surfaces or textures	.60	91	x				
3.1 Uses touch to distinguish gross differences in texture	.48	82	x				
3.5 Makes discriminations between cloth of similar textures	.69	77	x				
15.1 Localizes sound by pointing to source	.36	70	x	x	x	x	x
15.2 Uses a dominant auditory cue selected from the environment	.94	69	x	x	x		
15.3 Uses multiple auditory cues	.32	31			x	x	x
17.5 Demonstrates use of echo for object detection	.58	17				x	x

Directions, Turns. Of the sixteen items on "Directions, Turns" in Table IV, ten items had reliability coefficients of .30 or higher. They are listed below, in order of difficulty, or "Average per cent passed." The same notations indicate ages at which items can differentiate within the age groups to at least a minimum degree.

	Reliability Coefficient	Av. % Passed (ages 3-12)	Age Groups				
			3-4	5-6	7-8	9-10	11-12
12.2 Turns to face opposite direction	.68	90	x				
12.3 Makes quarter turn	.37	85	x				
12.1 Makes complete turn in place	.64	82	x				
8.5 Distinguishes right and left in the environment	.32	79	x	x			
8.2 Responds correctly to a command to turn left	.55	77	x	x			
12.4 Turns to establish a diagonal line of travel	.33	50		x	x	x	x
8.3 Correctly describes a familiar route in terms of right and left turns	.43	48		x	x	x	
8.4 Distinguishes left and right on body of another person	.30	40		x	x	x	x
22.1 Points out cardinal directions in a familiar setting	.45	19		x	x	x	x
22.3 Travels a route with one turn, described in terms of cardinal directions	.57	14				x	x

Movement in Space. Of the eighteen items on "Movement in Space" in Table IV, sixteen had reliability coefficients of .30 or higher. These items are listed below, in order of difficulty, or "Average per cent passed."

	Reliability Coefficient	Av. % Passed (ages 3-12)	Age Groups				
			3-4	5-6	7-8	9-10	11-12
25.3 Runs toward another person	.85	90	x				
27.4 Climbs down play equipment independently	.45	81	x	x			
23.2 Walks up steps one foot at a time without support	.36	72	x	x			
23.4 Walks up steps, alternating forward foot, one foot per tread	.49	70	x	x	x		
24.1 Hops on one foot	.76	68		x			
23.3 Walks down steps one foot at a time without support	.60	67		x	x		
24.2 Hops, alternating feet	.49	66		x			
26.3 Jumps off low wall or bench	.79	66		x			
26.4 Jumps, coordinating other body movements	.44	63	x	x	x		
23.5 Walks down steps, alternating forward foot, one foot per tread	.71	56		x	x	x	
24.3 Gallops	.72	55	x	x	x	x	x
4.5 Points toes in direction of travel	.73	50	x	x	x	x	x
4.4 Walks with weight properly distributed	.30	49	x	x	x	x	x
24.4 Skips	.67	45		x	x	x	x

	Reliability Coefficient	Av. % Passed (ages 3-12)	Age Groups				
			3-4	5-6	7-8	9-10	11-12
4.6 Walks with relaxed gait	.44	31	x	x	x	x	x
25.4 Runs freely by himself	.58	25		x	x	x	x

Self-Help. Of the twenty-three items on "Self-Help" in Table IV, fifteen had reliability coefficients of .30 or higher. These items are listed below, in order of difficulty, or "Average per cent passed."

	Reliability Coefficient	Av. % Passed (ages 3-12)	Age Groups				
			3-4	5-6	7-8	9-10	11-12
11.5 Unbuttons front buttons	.85	79	x	x			
9.3 Touches different parts of the body upon request	.55	74	x	x		x	
14.3 Returns materials and/or tools to specific places	.30	70	x	x			
10.2 Puts on sweater unassisted	.64	69		x			
10.3 Buttons sweater	.67	67		x			
14.4 Identifies simple tools	.58	67	x	x			
21.1 Discovers for himself which direction a car is facing	.51	63	x	x	x	x	x
10.4 Puts on sweater unassisted when one sleeve has been turned inside out	.66	57		x	x		

	Reliability Coefficient	Av. % Passed (ages 3-12)	Age Groups				
			3-4	5-6	7-8	9-10	11-12
9.4 Identifies by naming essential parts of body	.32	55	x	x	x	x	x
10.5 Puts on belt and fastens buckle correctly	.72	52		x	x	x	
7.5 Locates and demonstrates working parts of doors	.43	50		x	x	x	x
7.4 Tells how windows function	.36	44		x	x	x	x
7.7 Uses key to lock and unlock doors	.63	42		x	x	x	x
13.4 Dials telephone numbers successfully	.73	39			x	x	x
14.5 Uses helping hand efficiently	.84	39		x	x	x	x

Selecting Items for the Short Form

Since so many of the eighty-two items were relatively easy items, the staff decided to eliminate from further consideration those items which for all age groups combined had an "average per cent passed" of 80 per cent or above. Since fewer difficult items were available, items were retained if the "average per cent passed" for all age groups was 14 per cent or more. This criterion eliminated eighteen items as "too easy" and nine as "too difficult". Thus, application of this criterion reduced the number being considered for a "short form" to fifty-five items. These fifty-five items are listed in Appendix D2, beginning with Item 8.5 with an "average per cent passed" of 79 per cent and ending with Item 22.3 with an "average per cent passed" of 14 per cent.

The next criterion applied to these remaining items was that of a reliability coefficient of .40 or more. Items passing this criterion were distributed by area as follows:

Orientation and Mobility (taught in O-M programs)	1
Sensory Cues	2
Directions, Turns	4
Movement in Space	12
Self-Help	13

The three items in the first two areas were eliminated; and the remaining twenty-nine items were studied intensively by the staff. Of these, five additional items were eliminated by staff conference, four of which were in the area of "Self-Help" and one in "Movement in Space". Reasons for rejection were chiefly related to difficulty in administration and/or scoring; for example, the inclusion of a single item on the use of the car seemed unjustifiable; however, two items (Items 9.3 and 11.5) were omitted because several easy items on "Self-Help" had satisfactory reliability.

The remaining twenty-four items were included in the Short Form Edition, reproduced with standards for administering and scoring in Appendix E, Part I.

The twenty-four items, taken from several subscales, have been grouped into three major categories: (a) knowledge of directions and skill in making turns, (b) movement in space, and (c) self-help skills. This group of items has sufficient merit to warrant their use as a short form of the scale. These items are hereafter referred to as the Short Form of the Scale.

Items Included in Short Form

Directions, Turns

8.2 Responds correctly to a command to turn left
8.3 Correctly describes a familiar route in terms of right and left turns
22.1 Points out cardinal directions in a familiar setting
22.3 Travels a route with one turn described in terms of cardinal directions

Movement in Space

4.5 Walks with weight properly distributed

4.6 Walks with relaxed gait
23.4 Walks up steps alternating forward foot, one foot per tread
23.5 Walks down steps, alternating forward foot, one foot per tread
24.1 Hops on one foot
24.2 Hops, alternating feet
24.3 Gallops
24.4 Skips
25.4 Runs freely by himself
26.3 Jumps off low wall or bench
26.4 Jumps, coordinating other body movements

Self-Help

7.5 Locates and demonstrates working parts of doors
7.7 Uses key to lock and unlock doors
10.2 Puts on sweater unassisted
10.3 Buttons sweater
10.4 Puts on sweater (presented with one sleeve turned)
10.5 Puts on belt and fastens buckle correctly
13.4 Dials telephone numbers successfully
14.4 Identifies simple tools
14.5 Uses helping hand efficiently

Characteristics of the Short Form

Reliability

This Short Form, and two of the subscales, have reliability coefficients above .90 when results for all age levels are combined (Table V). The Kunder-Richardson coefficient for all age levels combined was also fairly high (.85), indicating considerable internal consistency in children's performance on the items. Further evidence of the internal consistency of the Short Form is summarized in Table VI. For 15 of the 24 items, pupil performance on the item correlated above .70 with total score on the Short Form.

TABLE V

RELIABILITY COEFFICIENTS FOR SHORT FORM

Scale	Age Groups			Total Group
	4-6	7-9	10-12	4-12
No. of cases:	14	14	16	44
Directions, Turns	.67**	.45	.32	.55**
Self-Help	.82**	.93**	.33	.91**
Movement in Space	.93**	.93**	.74**	.92**
Total Short-Form*	.79**	.62*	.59*	.91**

NOTE: The reliability coefficient was also computed for the Short Form by an internal consistency method (Kuder-Richardson Formula 21); the reliability coefficient (ages 4-12) was .85

* Significant at the .05 leve. ** Significant at the .01 level.

TABLE VI

CORRELATIONS BETWEEN SUCCESS ON INDIVIDUAL ITEMS AND TOTAL SCORE ON THE SHORT-FORM SCALE

Item	Estimated coefficients of correlation*
Direction-taking	
Item 8.2	.72
8.3	.67
22.1	.57
22.3	.66
Self-help	
Item 7.5	.64
7.7	.71
10.2	.82
10.3	.81
10.4	.84
10.5	.85
13.4	.52
14.4	.75
14.5	.85
Movement in Space	
Item 4.5	.37
4.6	.26

Table VI, cont'd.

Item	Estimated Coefficients
23.4	.74
23.5	.72
24.1	.85
24.2	.84
24.3	.63
24.4	.77
25.4	.41
26.3	.82
26.4	.74

*Product-moment correlations were estimated by computing the proportions of successes on each item made by the high-scoring 27 per cent and low-scoring 27 per cent of the children in terms of total score on the 24 items. The table used is from: Robert L. Thorndike. Personnel Selection. New York: John Wiley & Sons, 1949. pp. 348-352.

The number of cases used in the reliability sample hardly justifies the computation of coefficients for separate age groups. However, since the staff did not wish to give a misleading impression of high reliability as a result of the heterogeneity of the reliability sample, coefficients for three age groups were computed and were presented in Table V. Reliability seems to be quite satisfactory for all subscales for the youngest age group (ages 4-6). For the two older subgroups (7-9 and 10-12), the short subscale on Directions, Turns has reliability coefficients of only .45 and .32 respectively. At the highest age level (10-12), the longer self-help subscale also has low reliability (only .33), undoubtedly because of the small number of self-help items which are sufficiently difficult for this age grouping.

Retest effect

In Table VII are summarized data concerning the retest effect on pupils of re-administering the items within a two-week period. Only on the subscale on Movement in Space was a significant retest effect noted. In the middle age group (ages 7-9), there was a statistically significant gain in mean score of one score point on retesting. For this same subtest, the mean gain for all age groups combined was approximately one-half score point; this retest gain was also statistically significant.

TABLE VII

RE-TEST EFFECT ON SUB-SCALES OF THE SHORT FORM

Scale & Age Group	No. of Cases	Mean Score Test	Mean Score Re-test	Difference
Directions, turns				
4-6	14	1.21	1.43	.22
7-9	14	2.29	2.00	.29
10-12	16	2.81	3.00	.19
Total Group	44	2.11	2.17	.06
Self-help				
4-6	14	3.07	3.21	.14
7-9	14	6.29	6.36	.07
10-12	16	7.44	7.25	.19
Total Group	44	5.68	5.68	0.0
Movement in space				
4-6	14	4.64	5.21	.57
7-9	14	6.43	7.43	1.00*
10-12	16	9.69	8.12	.43
Total Group	44	6.32	6.95	.63*
Total Scale				
4-6	14	9.08	9.36	.28
7-9	14	14.75	15.75	1.00
10-12	16	18.00	18.38	.38
Total Group	44	14.54	14.00	.54

*Difference is significant at the .01 level. The standard error of the difference was computed by the formula which corrects for correlation between variables. (J. P. Guilford, Fundamental Statistics in Psychology and Education. New York: McGraw-Hill, 1956), p. 192.

Correlation of performance with age

Correlation with age was not a criterion for including items in the Short Form; however, each of the subtest scores did correlate significantly with chronological age. The total Short Form score correlated .69 with age; this correlation seems to be of almost optimum size. If total score did not correlate moderately well with age, the scale could not be considered to be a measure of maturity; on the other hand, if the correlation were very high, information on students' scores would reveal little that could not be predicted in terms of age alone. Of the three subscales, the one on Self-Help had the highest correlation with age (.72). The subscale "Movement in Space" had the lowest correlation with age (.46). All of the Short Form items which had a low correlation with age were from this subscale; they were:

		Correlation with age
4.5	Points toes in direction of travel	-.14
4.6	Walks with relaxed gait	.09
24.3	Gallops	.20
25.4	Runs freely by himself	-.04
26.3	Jumps off low wall or bench	.24
26.4	Jumps, coordinating other body movements	.05

These low correlations may reflect the greater tendency of younger children (who have had a pre-school counselor, nursery school experience, or both) to move about in a confident and relaxed manner in tasks involving large muscle skills. Case studies of young children who do well and older children who do poorly on these tasks might afford helpful clues concerning these low correlations with age.

Moderate correlations with age were obtained for all the other items of the Short Form. The correlations for the other 18 items are listed in order of size, within each of the subscales.

		Correlation with age
Directions, Turns		
8.2	Responds to command turn left	.52
8.3	Correctly describes a familiar route in terms of right and left turns	.51
22.1	Points out cardinal directions in a familiar setting	.43
22.3	Travels in a route with one turn, described in cardinal directions	.35
Movement in Space		
24.1	Hops on one foot	.55
24.2	Hops, alternating feet	.53
24.4	Skips	.40
26.4	Jumps, coordinating body movements	.40
23.4	Walks up steps, alternating forward foot, one foot per tread	.38
23.5	Walks down steps, alternating forward foot, one foot per tread	.38

Self-Help

10.4	Puts on sweater unassisted when one sleeve has been turned inside out	.57
13.4	Dials telephone numbers successfully	.57
10.3	Buttons sweater	.55
10.2	Puts on sweater unassisted	.52
10.5	Puts on belt and fastens buckle correctly	.51
14.5	Uses helping hand efficiently	.45
7.5	Locates and demonstrates working parts of doors	.41
7.7	Uses key to lock and unlock doors	.37

Several of the items correlating well with age require small-muscle coordination; others require balance; still others require the learning of space concepts and terms.

Correlations of item performance with age were computed for 13 additional items which met the reliability criterion of .40, but were later excluded from the Short Form for other reasons. These items are also listed in Table VIII. Of these 13 items, the following five had correlations with age which exceeded .40:

		Correlation with age
9.3	Touches different parts of body on request	.65
11.5	Unbuttons front buttons	.57
19.1	Uses appropriate hand to trail	.49
18.1	Correctly grasps sighted guide's arm	.44
15.2	Uses a dominant auditory cue selected from the environment	.43

TABLE VIII

CORRELATIONS OF CHRONOLOGICAL AGE WITH SHORT-FORM ITEMS AND SUB-SCALES, AND WITH THIRTEEN ADDITIONAL ITEMS WITH RELIABILITY COEFFICIENTS ABOVE .40.

Sub-Scales and Items	Number of children:		Mean age of children:		Correlation*
	Failing	Passing	Failing	Passing	
Directions, Turns					
Item 8.2	27	146	5.26	8.95	.52xx
8.3	78	95	6.66	9.32	.51xx
22.1	135	38	7.56	10.20	.43xx
22.3	144	29	7.74	10.05	.35xx
Total score on Directions, turns					.62xx
Movement in Space					
Item 4.5	87	86	8.60	7.64	-.09
4.6	119	54	8.30	7.76	-.09
23.4	33	111	6.71	8.95	.38xx
23.5	51	93	7.15	9.12	.38xx
24.1	42	131	5.44	8.90	.55xx
24.2	46	127	4.07	8.90	.53xx
24.3	69	104	7.30	8.11	.15
24.4	84	89	7.00	9.05	.40xx
25.4	127	46	7.89	7.75	-.03
26.3	39	116	7.04	7.74	.12
26.4	56	117	6.66	8.72	.40xx
Total score on Movement in Space					.46xx
Self-Help					
Item 7.5	76	97	6.88	8.98	.41xx
7.7	69	63	6.31	9.50	.37xx
10.2	39	134	5.61	8.85	.52xx
10.3	43	130	5.69	8.93	.55xx
10.4	61	112	5.95	9.04	.57xx
10.5	70	102	6.50	9.40	.51xx
13.4	97	76	6.82	9.74	.57xx
14.4	45	128	6.81	10.23	.59xx
14.5	96	77	7.10	9.40	.45xx
Total score on Self-Help					.72xx
Total score on Short Form					.69xx

TABLE VIII (Continued)

Sub-Scales and Items	Number of children:		Mean age of children:		
	Failing	Passing	Failing	Passing	Correlation*
Additional items with reliability coefficients above .40					
Item 3.5	28	145	5.83	8.40	.39xx
9.3	35	138	6.91	11.04	.65xx
10.7	73	66	8.39	9.31	.18xx
11.5	23	149	4.50	8.71	.57xx
15.2	43	130	6.24	8.77	.43xx
17.5	139	34	7.80	9.38	.24xx
18.1	150	23	7.74	11.10	.44xx
18.8	151	22	7.76	10.80	.38xx
19.1	32	141	5.36	8.70	.49xx
21.1	30	92	7.36	8.95	.33xx
23.3	32	112	6.02	9.13	.34xx
25.3	15	158	6.64	8.27	.17
27.3	21	129	6.59	8.61	.29xx

* Correlations for items were computed by formula for point biserial r. The formula used is taken from: Robert Thorndike, Personnel Selection: Test and Measurement Techniques (New York: John Wiley and Sons, 1949), p. 164. Correlations for sub-scale scores were computed by the product-moment method.

xx Correlation is significant at the .01 level.

The correlation of performance on Items 18.1 and 19.1 with age may be explained, in part, by the fact that younger children are not as likely to have had instruction in these skills.

Comparison of Blind and Light Perception Subjects

In Table IX results have been summarized separately for the 109 blind children and the 54 children with light perception. On 14 of the 24 items, differences between the two groups were small and not statistically significant. On the following six items, the children with light perception were more likely to pass:

		Difference
4.5	Points toes in direction of travel	15%
4.6	Walks with relaxed gait	14%
23.4	Walks up steps, alternating forward foot, one foot per tread	8%
23.5	Walks down steps, alternating forward foot, one foot per tread	12%
24.3	Gallops	9%
25.4	Runs freely by himself	10%

On the following four items, the blind children tended to succeed more frequently than those with light perception:

		Difference
22.1	Points out cardinal directions in a familiar setting	4%
22.3	Travels a route with one turn described in terms of cardinal directions	3%
7.5	Locates and demonstrates working parts of doors	8%
10.4	Puts on sweater unassisted when one sleeve has been turned out	4%

The differences favoring the blind children tended to be smaller than those listed as favoring children with light perception. The comparisons of the performance of the blind and light perception subjects on all the items of the Short Form are presented in Table IX.

TABLE IX

COMPARISON OF PERFORMANCE OF BLIND SUBJECTS AND SUBJECTS WITH LIGHT PERCEPTION ON ITEMS OF THE SHORT FORM

Items	Average per cent of plus responses		Differences
	Blind (N-109)	Light Perception (N-64)	
Directions and Terms			
8.2	74.6	77.2	+ 2.6
8.3	46.9	45.9	- 1.0
22.1	19.8	15.6	- 4.2++
22.3	14.4	11.6	- 2.8++
Movement in Space			
4.5	45.7	60.7	+15.0++
4.6	28.7	42.7	+14.0++
23.4	65.7	74.0	+ 8.3 ++
23.5	52.4	64.6	+12.2++
24.1	67.3	64.2	- 3.1
24.2	65.7	61.4	- 4.3
24.3	50.9	59.8	+ 8.9+
24.4	45.1	44.2	- 0.9
25.4	21.6	31.2	+ 9.6++
26.3	62.8	65.5	+ 2.7
26.4	62.0	62.0	0.0
Self Help			
7.5	52.3	44.4	- 7.9+
7.7	44.2	33.8	-10.4++
10.2	67.6	68.8	+ 1.2
10.3	66.0	64.7	- 1.3
10.4	54.8	60.2	+ 5.4
10.5	53.0	49.2	- 3.8
13.4	38.5	35.5	- 3.0
14.4	68.2	64.8	- 3.4
14.5	38.5	37.8	- 0.7
Average			

x Significant at the .05 level
xx Significant at the .01 level

Intercorrelations among subscales

All the intercorrelations among subscales of the Short Form are statistically significant at the .01 level (Table X). The lowest correlation (.39) was between Directions and Turns and Movement in Space. All correlations of subscales with total score exceeded .70.

TABLE X

INTERRELATIONS OF SUB-SCALES OF SHORT FORM

Sub-tests	Sub-Test			
	Directions, Turns	Movement in Space	Self-Help	Total Short Form
Directions, Turns		.39xx	.59xx	.71xx
Movement in Space			.65xx	.89xx
Self-Help				.90xx

xx Significant at the .01 level

Distribution of scores on the Short Form

The distribution of scores attained by the 173 subjects on the Short Form is presented in Table XI. The median scores show a progressive increase with age: 3-4 years, 2.0; 5-6 years, 8.8; 7-8 years, 14.8; 9-10 years, 17.3; and 11-12 years, 18.5. It will be noted that the 75th percentile point for the oldest age group was still 4 points below the maximum score, and that there was considerable spread of scores at each age level.

TABLE XI

DISTRIBUTION OF SHORT FORM SCORES BY AGE GROUPS

Total Score	Age Groups				
	3-4	5-6	7-8	9-10	11-12
24					
23		1	1		2
22			1	1	2
21				4	3
20				4	6
19			3	5	7
18			1	4	4
17		3	5	10	3
16		1	4	2	2
15		1	9	5	2
14		3	2		1
13			1	2	1
12	1	1	4		2
11		3			2
10	1	1	1		1
9		3		1	1
8	1	2	2		1
7		2	4		
6	1	1	1	2	
5		2	2		
4					
3	1	2	1		
2	7	2			
1	3	3			
0	2	1			
Total	17	22	42	40	40
P75	3.3	13.5	16.6	19.3	20.0
P50 (Median)	2.0	8.8	14.8	17.3	18.5
P25	1.3	4.5	10.0	15.5	15.0

CHAPTER IV

SUMMARY, INSTRUMENTS AND RECOMMENDATIONS

Summary and Instruments

Background

Phase I of this Project (Conducted in 1965-66) was concerned primarily with the identification of orientation and mobility skills which were considered to be essential for young blind children. (6) The following sources were used in identifying these skills: (a) developmental studies of normal children, (b) lists supplied by experienced teachers who observed blind children and recorded skills being used or skills which were needed in daily tasks, and (c) other tests and scales. The master list of orientation and mobility skills was prepared from these sources and used as a basis for constructing a scale which was comprised of forty-two subscales, each of which had three or more items arranged in approximate developmental order.

A jury (comprised of teachers of the blind, child development specialists, and mobility specialists) reviewed an edition of the scale in which the order of the subscale items had been randomized; each jury member recommended the ordering of items within each subscale in terms of developmental sequence.

The preliminary edition of the Scale was given a limited field trial as a means of checking the directions and scoring, as well as to obtain further evidence of the scalability of groups of related items.

This project being reported here had for its major purpose the refinement of the Scale; preparation of an Experimental Edition, and the establishment of tentative norms.

Experimental Edition

The Experimental Edition was comprised of 26 subscales, each of which had three or more items, arranged in order of estimated difficulty based on jury ratings, limited try-out, and staff judgment. The subscales were classifiable under the following major categories: (a) Self-help in relation to travel, (b) formal pre-cane orientation and mobility skills, (c) movement in space, (d) use of sensory cues in travel, and (e) use of directions and making turns.

The Scale was administered to 173 subjects (blind or light perception only) who were judged to be average in intelligence and free from other disabilities which might interfere with success in travel. All subjects were between the ages three to twelve years. The pre-school children were included in order to provide a basis for evaluating school-age children of below average development in these skills.

Reliability. (1) All tests were given by either of two examiners who had had special training. Test and retest data for forty-four subjects were used to determine the reliability of individual items; (2) Twenty-four items were selected as meeting criteria with respect to difficulty, reliability, and objectivity of administration and scoring; (3) The test-retest reliability coefficient for the Short Form was .91. However, this high reliability may be accounted for, in part, by the age spread of the subjects. Reliability coefficients for more homogeneous groups were as follows: ages 4-6, .79; ages 7-9, .62 and ages 10-12, .59.

Norming Data. Data for norming were obtained by testing 173 subjects, distributed by age as follows: ages 3-4, 17; ages 5-6, 33; ages 7-8, 43; ages 9-10, 40; and ages 11-12, 40. All subjects were enrolled in well-established pre-school or school programs. The norming sample was stratified so as to be representative, with respect to sex of child and type of school program (residential vs. day school), of the population of children enrolled in well-established programs for the blind. Subjects were selected from programs located in the western, central, and eastern sections of the United States.

One of the greatest recurring problems encountered during the construction of the Scale and during its administration was the lack of comparability of conditions for testing. For example, the rooms available for use in testing vary in size; hence there are wide variations in the opportunities afforded different subjects to explore the room; other physical features, such as side walls, steps, etc., vary considerably, and finally, cues, especially sound cues, vary in intensity, duration, etc., from situation to situation. Some schools were unable to supply adequate situations for assessing pupil performance in certain items.

Tentative norms were reported on the 82 items which met the "minimal effectiveness" criterion of being passed by 20-80 per cent of the children in one or more of the age groups studied. Twenty-four of these items were selected and developed into a Short Form with tentative norms. (Appendix E, Part I and Part III) This instrument had a reliability coefficient of .91 (on the basis of test-retest by different examiners) and a

Kuder-Richardson reliability coefficient of .85.

Other items in the Experimental Edition of the Scale were regrouped and developed into two instructional tests with standardized procedures for administration and scoring.

Instruments Produced

The following instruments which resulted from the Project are included in the report:

ORIENTATION AND MOBILITY SCALE FOR YOUNG BLIND CHILDREN - SHORT FORM, EXPERIMENTAL EDITION (Appendix E, Parts I and III)

A scale of 24 items which proved reliable both in terms of inter-examiner reliability and internal consistency. The items relate to movement in space, directions and turns and self-help. Tentative age norms have been provided.

INSTRUCTIONAL TASKS IN ORIENTATION AND MOBILITY FOR YOUNG BLIND CHILDREN (Appendix E, Part II)

Section A. Precane orientation and mobility skills

Five scales covering pre-cane skills. The instruments are offered to the profession as an instructional test. Since few children have received formal instruction, the performance of the norming sample was too low to provide meaningful norms. When orientation and mobility training is more widely available to elementary school children, normative data should be obtained.

Section B. General orientation and mobility skills

Subscales which cover a wide range of abilities including use of telephone, entering and leaving an automobile, use of tactual cues. These items either had low reliability coefficients, were too easy, or involved; some problems in administration. However, they can be helpful in the informal appraisal of children's needs and accomplishments. Later investigators may develop improvements in instructions, materials, or scoring standards which will result in greater item difficulty and/or reliability. Moreover, use within a single school may allow for greater control over examination settings and greater comparability of results from pupil to pupil.

Recommendations

Relating to Research

The widespread interest in extending instruction in orientation and mobility skills (formerly taught only to adults) to include blind children as well, justified continuous efforts to develop instruments for the measurement of these skills. Such instruments will be useful in experimental work with various methods of instruction, in determination of an optimum age for training, in the assessment of individual differences in children's readiness for such instruction, etc. Without benefit of the data which such instruments will yield, sound training programs for young children will be difficult to devise and modify in terms of "feedback" data on effectiveness of training.

1. It is recommended that active research be undertaken in the study of the blind child's formation of concepts relating to space and environment control. Concepts of space and spatial relationships are essential to travel, e.g. parallel, intersection, positional relationships (beside, in front, etc.). Also, adequate notions of objects commonly found in the environment, such as mail boxes, hydrants, curbs, etc., are essential to successful management of oneself in the environment. Although concept development presents difficult problems in measurement, efforts should be made to develop tests which will measure a blind child's spatial understanding of his environment.

2. The development of a scale for use with very young children - perhaps 2-5 years of age - appears desirable. Their environment must be made meaningful to blind children at as early an age as possible since attitudes toward travel are doubtlessly established during these formative years. Although some children of four or five demonstrated unusual competence, others seemed insecure while performing such elementary tasks as walking. Early basic training would help the child avoid or overcome such insecurity and should lead to greater independence in adolescence and adulthood. Consequently, instruments for measurement at these ages seems especially desirable.

3. Many instructional tests could be developed around life situations with which a child has to cope, i.e., travel about school, going about one's home, traveling by car or bus, handling street patterns, etc.

4. Undoubtedly, attitudes such as independence, interest in exploration, anxiety and self-esteem are factors which influence mobility. The relationships of such personality factors to proficiency in orientation and mobility skills should provide fruitful problems for research.

5. Since auditory cues are so important for the blind, special studies should be undertaken to determine the factors which influence the successful use of such cues by children.

6. The arms, hands and trunk play a part in the total response to walking. It should be profitable to study the unique roles these and other body parts play in mobility. How are the hands used in the performance of typical tasks? How are gait patterns and rate of walking related to various developmental tasks?

7. Some blind four-year olds performed certain skills as well as some twelve-year olds. Studies should be conducted to determine possible reasons for these wide variations from age-typical behavior.

8. No effort was made in this project to deal with skills relating to travel with a cane. Travel of the blind adolescent with the aid of a cane constitutes a very fruitful area for the development of instruments for diagnosis and appraisal.

Specific Recommendations Relating to the Instrument

The two instruments which have been developed as a part of the project are preproduced in Appendix E. The instruments are:

ORIENTATION AND MOBILITY SCALE FOR YOUNG BLIND CHILDREN - SHORT FORM, EXPERIMENTAL EDITION

INSTRUCTIONAL TASKS IN ORIENTATION AND MOBILITY

Section A. Precane orientation and mobility skills.

Section B. General orientation and mobility skills.

The following recommendations are made with respect to these instruments:

1. Effort should be made to expand the number of items in the Short Form. The items are currently limited to those which showed real promise in the field trials. Other items in the first Experimental Edition should be modified, tested, and added to the Short Form. Appendix F lists sources for additional items. The Field Examiner's notes relating to the evaluation of specific items are reproduced in Appendix G. These note incorporate suggestions for improving the items.

2. Due to the importance of early training, a primary edition of the scale should be developed for use with blind children of pre-school or kindergarten age. Many promising items are to be found in the Preliminary and Experimental Editions of the Scale. The scale might well include special items relating to self-help - eating, grooming, etc. - as well as those relating more directly to mobility.

CITED REFERENCES

1. Cain, Leo F.; Levine, Samuel; and Elzey, Freeman F. Cain-Levine Social Competency Scale. Palo Alto, California. Consulting Psychologists Press. 1963.

2. Doll, E. A. Vineland Social Maturity Scale. Vineland Training School at Vineland. New Jersey. 1936.

3. Green, Bert F. "A Method of Scalogram Analysis Using Summary Statistics," Psychometrika. 21:79-88, March, 1956.

4. Jones, John W., and Collins, Anne P. Educational Programs for Visually Handicapped Children. United States Department of Health, Education, and Welfare, Office of Education - 35070 Bulletin, 1966, No. 6.

5. Kephart, Newell C. The Slow Learner in the Classroom. Columbus, Ohio: Charles E. Merrill Books, Inc., 1960, p. 46.

6. Lord, Francis E., et al. Identification of Orientation and Mobility Skills Relating to Developmental Tasks for Young Blind Children. Project Number 5-0980-4-11-3, Office of Education, Division of Handicapped Children and Youth, Department of Health, Education, and Welfare. 1966.

7. Lord, Francis E. "A Study of Spatial Orientation of Children," Journal of Educational Research. XXXIV, March, 1941.

8. Maxfield, Kathryn E., and Buchholz, Sandra. A Social Maturity Scale for Blind Preschool Children: A Guide to Its Use. American Foundation for the Blind, Inc., 1957.

9. Siegel, Sidney. Nonparametric Statistics for the Behavioral Sciences. New York. McGraw-Hill Book Co., Inc. 1956.

10. Thorndike, Robert L. Personnel Selection: Test and Measurement Techniques. New York. John Wiley and Sons, Inc., 1949.

11. Trowbridge, C. C. "Fundamental Methods of Orientation and Imaginary Maps," Science. XXXVIII, December 19, 1913.

APPENDIX A

SELECTED REFERENCES

(For a more extended bibliography relating to development of motor skills and research related to sensory aspects of mobility, the reader is referred to the comprehensive bibliography in the report of Phase I of the Project.) (6)

Axelrod, S. "Effects of Early Blindness: Performance of Blind and Sighted Children on Tactile and Auditory Tasks," American Foundation for the Blind Research Series No. 7. New York: American Foundation for the Blind, 1959.

Bartley, S. H. "The Perception of Size or Distance Based on Tactile and Kinesthetic Data," Journal of Psychology. 36:401-408, 1953.

Bartley, S. H.; Clifford, L. T.; and Calvin, A. D. "The Effect of Visual Imagery on Tactual and Kinesthetic Space Perception," Perceptual and Motor Skills. 5:177-184, 1955.

Cain, Leo F.; Levine, Samuel; and Elzey, Freeman F. Cain-Levine Social Competency Scale. Palo Alto, California: Consulting Psychologists Press, 1963.

Cotzin, M., and Dallenback, K. M. "Facial Vision: The Role of Pitch and Loudness in the Perception of Obstacles by the Blind," American Journal of Psychology. 63: 485-515, 1950.

Curtin, George T. "Mobility: Social and Psychological Implications," The New Outlook for the Blind. 56: 14-18, January, 1962.

Cutsforth, T. D. "An Analysis of the Relationship between Tactual and Visual Perception," Psychological Monographs. 44:125-152, 1933.

Dallenbach, K. M. "The Perception of Obstacles by the Blind," Psychological Bulletin 38. 38: 610-611, 1941.

Doll, E. A. Vineland Social Maturity Scale. Vineland Training School at Vineland, 1936.

Drever, James. "Early Learning and the Perception of Space," American Journal of Psychology. 68: 605-614, 1955.

Dupress, J. K., and Wright, H. N. "Identifying and Teaching Auditory Cues for Traveling in the Blind," *American Foundation for the Blind Research Bulletin No. 1.* 1:3-9, January, 1962.

Ebihara, T. "Stimulus Threshold of Shapes of Blind Children," *Journal of Psychology of the Blind*. 4:27-31, 1958.

Ewart, Anne G., and Carp, Frances M. "Recognition of Tactual Form by Sighted and Blind Subjects," *American Journal of Psychology*. 76, (3), 1963.

Fisher, Gerald H. "Spatial Localization by the Blind," *American Journal of Psychology*. 77, March, 1964.

Foulke, Emerson. "A Multi-Sensory Test of Conceptual Ability," *New Outlook for the Blind*. 58:75-77, March, 1964.

Garry, Ralph J., and Ascarelli, Anna. "Teaching Topographical Orientation and Spatial Orientation to Congenitally Blind Children," *Journal of Education*. 143:1-48, December, 1960.

Henry, F. M. "Dynamic Kinesthetic Perception and Adjustment," *Research Quarterly of the American Association for Health, Physical Education and Recreation*. 24:176-187, 1953.

Hoover, R. E. "Orientation and Travel Techniques," *Proceedings of the American Association of Workers for the Blind*. 1947.

Hunter, William F. "An Analysis of Space Perception in Congenitally Blind and in Sighted Individuals," *Journal of Genetic Psychology*. 70:325-329, April, 1964.

Kohler, Ivo. "Orientation by Aural Clues," *American Foundation for the Blind Research Bulletin No. 4*. 4:14-54, January, 1964.

Maxfield, Kathryn E., and Buchholz, Sandra. *A Social Maturity Scale for Blind Preschool Children: A Guide to Its Use*. New York: American Foundation for the Blind. 1957.

Maxfield, Kathryn E., and Kenyon, Eunice L. *A Guide to the Use of Maxfield-Fjeld Tentative Adaptation of the Vineland Social Maturity Scale for Use With Visually Handicapped Preschool Children*. New York: American Foundation for the Blind, 1953.

McReynolds, Jane, and Worchel, P. "Geographic Orientation in the Blind," *Journal of General Psychology*. 51:221-236, October, 1954.

Mills, A. W. "Auditory Perception of Spatial Relations," *Proceedings of International Congress on Technology and Blindness*. New York: American Foundation for the Blind. June, 1963.

Nolan, C. Y., and Morris, June E. "Variability Among Young Blind Children In Object Recognition," *International Journal for the Education of the Blind*, 10:23-25, 1960.

Norris, Miriam; Spaulding, Patricia J.; and Brodie, Fern H. *Blindness in Children.* Chicago: University of Chicago Press, 1957.

Supa, M.; Cotzin, M.; and Dallenbach, K. M. "Facial Vision: The Perception of Obstacles by the Blind," *American Jouranl of Psychology*. 56:133-183, 1944.

Worchel, P., and Mauney, J. "The Effect of Practice on the Perception of Obstacles by the Blind." *Journal of Experimental Psychology*, 41:170-176, 1951.

Worchel, P., and Dallenbach, K. M. "Facial Vision: Perception of Obstacles of Deaf-Blind Subject," *American Journal of Psychology*. 60:502-553, 1947.

Worchel, P. "Space Perception and Orientation in the Blind," *Psychological Monographs 65*. American Psychological Association, 1951.

Worchel, P., and Dallenbach, K. M. "The Vestibular Sensitivity of Deaf-Blind Subject," *American Journal of Psychology*. 61:94-99, January, 1948.

APPENDIX B

EXPERIMENTAL EDITION OF THE ORIENTATION AND MOBILITY SCALE FOR YOUNG BLIND CHILDREN

Introduction

One of the most basic needs for blind children and youth is the ability to orient to the seeing world and to be mobile in their environment. Thus, skills in orientation and mobility instruction should become an integral and vital part of the blind child's education. It is essential that progress toward independence in orientation and mobility be assessed and that instruction be planned accordingly.

"Orientation and mobility" has been defined in the broadest sense to include all the adjustments and skills that the blind person needs for effective interaction with his total environment. These adjustments and skills incorporate interpersonal relations, social skills, and the physical navigation of his immediate and extended environment. A more limited definition of each of the two terms has been set forth as follows: Orientation is the process the blind person uses in utilizing the remaining senses to establish his position and relationship to all other significant objects in his environment; mobility is the ability to navigate from his present fixed position to his desired position in another part of the environment.

The Scale which is described in this report reflects a definition of orientation and mobility which is somewhat between the broad and the narrow definition. The primary emphasis is given to skills which relate to the management of spatial environment and the motor tasks related thereto. Some self-help skills such as dressing, use of telephone, and eating were included due to their special significance or direct relationship to the management of one's self in travel.

The Scale is intended for use by preschool counselors, classroom teachers of the blind, and orientation and mobility specialists to describe the performance of blind children in handling elementary, pre-cane skills relating to orientation and mobility. The Experimental Edition of the Scale is intended for use with blind children, ages three to twelve. The Scale is applicable for use with the totally blind and for children with light perception or light projection, the latter being defined as the ability to point to the source of light.

The Instrument

Source of Items

The skills which are incorporated in the Scale were drawn mainly from the following sources:

1. Developmental data relating to young children.
2. Skills identified by teachers of blind children during special observations.
3. Research studies relating to development of young blind children.
4. Lists of skills previously identified by orientation and mobility specialists.

Subscales

The Instrument includes twenty-seven subscales, each of which has three or more items or levels. Within each subscale the items are arranged in order of difficulty. Item one should be easier than item two, two easier than three, etc. Each item in a subscale represents a level of performance for that scale. These levels are differentiated according to maturational factors. For example, a child learns to take steps before he walks up steps; a child walks before he learns to jump.

In some subscales, the items represent a progressive independence of assistance from other persons, while in others the items incorporate a gradual reduction in cues necessary to perform the task.

The subscales may be roughly classified into the following major groups;

Scales which relate primarily to self help:

Seating oneself
Putting on clothing
Removing clothing
Using the telephone
Entering and leaving automobile
Handling simple tools and materials
Identifying parts of body
Using doors and windows

Scales which relate primarily to formally taught orientation and mobility scales:

- Using search pattern
- Using direction-taking
- Using trailing techniques
- Using sighted guide

Scales which relate primarily to typical movements in space:

- Walking
- Walking up and down steps
- Hopping and skipping
- Running
- Jumping
- Climbing

Scales relating primarily to the use of sensory cues in travel:

- Using tactual cues
- Auditory cues and localization
- Auditory cues and travel

Scales relating primarily to directions and turns:

- Using right and left
- Understanding turns
- Reversing routes
- Cardinal directions

This grouping of the subscales is not readily apparent since the subscales are arranged in the Manual in an order assumed to be convenient for administration.

Order of Administration

The scales are arranged essentially into two groups. The first group includes those subscales which are easily administered in an ordinary school building using a typical classroom, hall, etc. The second set of scales requires a special setting, including streets with traffic, the presence of large buildings, a sidewalk, and a play area. This grouping allows the examiner to progress from setting to setting with convenience.

Subscales which can Best Be Administered in a Typical Classroom Setting: Halls, etc.

1. Seating
2. Using Familiarization Techniques
3. Using Tactual Cues
4. Walking
5. Using Direction Taking
6. Using Search Pattern
7. Using Doors and Windows
8. Using Right and Left
9. Identifying Parts of Body
10. Putting on Clothing
11. Removing Clothing
12. Understanding Turns
13. Using the Telephone
14. Handling Simple Tools and Materials
15. Auditory Cues - Localization

Subscales Which Require Outdoor Areas

16. Auditory Cues - Identification
17. Auditory Cues - Travel
18. Using a Sighted Guide
19. Using Trailing Techniques
20. Reversing Routes
21. Entering and Leaving an Automobile
22. Understanding Cardinal Directions
23. Walking Up and Down Stairs
24. Hopping and Skipping
25. Running
26. Jumping
27. Climbing

It should be noted that in a number of subscales, observations may be made while checking one item which are sufficient to score several succeeding items. Such items are clearly designated in the scoring explanations.

Procedures for Scoring

Each item should be scored in the following manner:

Plus: +	Behavior or response meets standard described for scoring.
Plus Parenthesis: (+)	Credit assigned by examiner. Skill was demonstrated as part of previous item.
Minus: -	Behavior or response does not meet the standard described for scoring.
Minus Parenthesis: (-)	Failure assigned by examiner. Subject demonstrated on previous item that he could not perform the required task.
No Opportunity: N.O.	No opportunity to observe. Subject cannot be scored on items due to any one of the following conditions:
Physical Setting:	Setting did not provide an adequate opportunity for judging the behavior.
Weather Conditions:	Weather conditions (wind, rain, snow) interfere with auditory cues and/or travel conditions and prevent an adequate testing situation.
Personal Factors:	Because of emotional disturbance, fatigue, or some other reason, the child appears to be unable to react or to respond with alertness.

Score Sheet

The score sheet lists each subscale, including an abbreviated title of each item, arranged in the order suggested for ease of administration. The examiner should make a brief notation to justify N O (No opportunity) ratings. It is important during the testing to record as much supplementary information as possible which will assist in interpreting scores.

Test Materials

The test kit included the following materials to be used with the subscales as indicated below:

Subscale and Item Number		Materials
3.1	Tactual Cues	Two 3/4" dowels 2½" long; one 3/4" spiral dowel (glue pin 2½" long, available at lumber yards)
3.2	" "	Empty spool, bottle cap, typewriter ribbon can
3.5	" "	Three samples cloth: 2 cotton, 1 satin, of similar shades, 2x3½", pasted at one edge to cardboard 8x4½"
3.6	" "	Three mounted pices of paper, 2 braille, 1 newsprint, 2x3½"
6.1	Search Pattern	Four 1" steel washers
6.2-.4	" "	One 1" steel washer
7.7	Doors and Windows	Key to classroom door
10.3	Putting on Clothing	Cardigans for both boys and girls, large and small
11.3	Removing Clothing	Cardigans and belts
14.1	Handling Tools	Toy car, hammer, book
14.2	" "	Toy hammer, five medium-size nails, two pieces of scrap lumber
14.3	" "	Men's tie box, 4 1/8"x14¼", divided into three equal compartments; scissors and marking wheel
14.4	" "	Pliers, braille ruler, screwdriver, handsaw
14.5	" "	Marking wheel, three-inch heart pattern
22.1-.3	" "	Compass to verify directions

GLOSSARY

Orientation and Mobility Terms Used in the Scale
(Examples in Parentheses)

Sound Shadow: An interruption of the flow of sound waves caused by the presence of an object or objects which lay between the sound source and the preceiver. (A telephone pole or parked car may result in a momentary interruption in the flow of sound.)

Landmark: Any familiar object, sound, odor, or temperature that is easily recognized and that has a known and exact location in the environment. (Smell of food from bakery area, sound of typewriters in the school office, the voices on the playground, or the shade of a building.)

Reference Point: A reference point is any familiar tactual cue that is easily recognized and that has a known and exact location. (In placing dishes on the table, the point of reference will be the edge of the table. In telling whether or not a picture is straight, the point of reference may be the back of a sofa.)

Trailing: The act of using the back of the fingers or fingernails to follow lightly over a surface (e.g. wall, lockers, desks, tables, etc.) for one or all of the following reasons: (a) to determine one's place in space; (b) to locate specific objects; (c) to get a parallel line of travel. (See "Trails").

Direction Taking: The act of getting a line or course from a fixed object or a sound to facilitate traveling in a straight line toward an objective. (Child faces a continuous source of sound such as a fan or blower and walks directly toward it.)

Familiarization: A sequence of specific taught techniques utilized by the blind person to explore upon entering a strange room or to become acquainted with a given unfamiliar area.

Trails: A prescribed pattern for using the back of the fingers or fingernails to follow or explore a given surface or object in the environment. (Follows a wall using hand to keep a parallel line of travel and to locate specific objects.)

Squaring Off: The act of aligning and positioning one's body in relation to an object, for the purpose of getting a line of direction and establishing a definite position in the environment. (Blind child positions himself parallel to a wall or with a door opening in order to walk directly to a selected object or goal.)

Information Point: A familiar object, sound, odor, temperature, or tactual clue whose exact location in the environment is known but is more difficult to recognize or perceive than a landmark. (A book shelf cn a student desk serves to aid the child in knowing the front or back of his desk.)

Dominant Cue Of the several cues that may be present, the one that most adequately fulfills the greatest informational needs at that moment.

Guide Line: The line formed by the meeting of two contrasting surfaces in the terrain, i.e., the border or edge of a sidewalk or path or the grass line.

Protective Stooping Technique: In stooping or bending, one arm should be held up, hand with palm out, protecting the face and head.

IDENTIFYING DATA

NAME______________ SEX____ BIRTH__________________________
Last First Month Day Year

PARTENTS' NAME______________ HOME ADDRESS__________________

SIBLINGS________ AGES________ FATHER'S OCCUPATION__________
Number

SCHOOL RECORD

Preschool: None___ Services of Preschool Worker__________

Enrollment: Short term residential__ Nursery school-Blind Children____ Nursery Sighted Children ____

School of Attendance: __________ __________ __________
School District Grade

Type of Program: Cooperative ____ Resource ____ Itinerant ____ Residential ____

Measured Intelligence: _____________ Date_____ I.Q.______
Name of test

Teacher's Judgment of Mental Ability: Above Average___ Average___ Below Average ____

Diagnosis _______ Acuity___ ___ _______________
OS OD Both Eyes

Onset of Blindness: Birth__ Age___ Hearing: Normal____ Loss_____

Other Physical Defects_________________________________

FORMAL O & M TRAINING
None____ Teacher Only____ Specialist ____

If by a Specialist; ______________ __________________
Amount (Hrs) Frequency (Times per week)

____
Age (given)

ORIENTATION AND MOBILITY SCALES SCORE SHEET

Name____________________

Date______________ B___ LP___

Sex	Birth Date	Age	No.

1. SEATING SELF
____ .1 Seats self - two contacts
____ .2 Seats self - one contact
____ .3 Seats self - independently (chair)
____ .4 Seats self - independently (table)

2. FAMILIARIZATION TECHNIQUES
____ .1 Explores with guide
____ .2 Trails perimeter of room
____ .3 Notes objects within reach
____ .4 Demonstrates awareness of objects
____ .5 Estimates size of room

3. USING TACTUAL CUES
____ .1 Distinguishes gross differences
____ .2 Investigates through touch
____ .3 Distinguishes surface differences
____ .4 Discriminates - surfaces (objects)
____ .5 Discriminates - textures (cloth)
____ .6 Discriminates - textures (paper)

4. WALKING
____ .1 Walks with support
____ .2 Walks without support
____ .3 Walks with cross pattern
____ .4 Weight distributed
____ .5 Toes in direction of travel
____ .6 Walks with relaxed gait

5. USING DIRECTION TAKING
____ .1 Uses sound sources
____ .2 Demonstrates squaring off
____ .3 Determines direction of travel
____ .4 Moves toward selected goal
.5 Returns to starting point

6. USING SEARCH PATTERN
____ .1 Pinpoints dropped objects
____ .2 Uses search pattern - circular
____ .3 Uses search pattern - square
____ .4 Uses protective stooping technique

7. USING DOORS AND WINDOWS
___ .1 Identifies doors
___ .2 Identifies windows
___ .3 Tells how doors function
___ .4 Tells how windows function
___ .5 Demonstrates door parts
___ .6 Demonstrates window parts
___ .7 Uses door key

8. USING RIGHT AND LEFT
___ .1 Left and right on own body
___ .2 Correctly turns left
___ .3 Describes R-L turns
___ .4 Distinguishes R-L on another person
___ .5 Distinguishes R-L in environment

9. IDENTIFYING PARTS OF BODY
___ .1 Touches mouth
___ .2 Touches extremities
___ .3 Touches other parts of body
arm waist shoulder knee
___ .4 Names parts of body
leg head back elbow neck chest

10. PUTTING ON CLOTHING
___ .1 Sweater - assistance
___ .2 Sweater - unassisted
___ .3 Buttons sweater
___ .4 Sweater - one sleeve turned
___ .5 Puts on belt - fastens
___ .6 Zips jacket - without assistance
___ .7 Ties bowknot

11. REMOVING CLOTHING
___ .1 Oxfords with assistance
___ .2 Oxfords without assistance
___ .3 Sweater without assistance
___ .4 Zippered without assistance
___ .5 Unbuttons front buttons

12. UNDERSTANDING TURNS
___ .1 Complete turn in place
___ .2 Turns opposite direction
___ .3 Makes quarter turn
___ .4 Turns to establish a diagonal
___ .5 Turns stated in degrees
360° 180° 90° 45°

13. USING THE TELEPHONE

___ .1 Locates the telephone
___ .2 Answers telephone
___ .3 Calls using operator
___ .4 Dials successfully

14. HANDLING SIMPLE TOOLS - MATERIALS

___ .1 Locates tools and materials
___ .2 Places tools in order
___ .3 Returns materials - tools
___ .4 Identifies tools
___ .5 Uses helping hand

15. AUDITORY CUES - LOCALIZATION

___ .1 Localizes sound source
___ .2 Uses dominant auditory cue
___ .3 Uses multiple auditory cues
___ .4 Maintains parallel line of travel

*16. AUDITORY CUES - IDENTIFICATION

___ .1 Identifies voices
___ .2 Identifies common sounds
___ .3 Identifies sound sources

17. AUDITORY CUES - TRAVEL

___ .1 Uses sound cue as landmark
___ .2 Uses moving sound
___ .3 Uses stationary sound source
___ .4 Detects large objects
___ .5 Uses echo for detection
___ .6 Detects sound shadow

18. USING SIGHTED GUIDE

___ .1 Correctly grasps arm
___ .2 Walks correctly with guide
___ .3 Uses positional cues
___ .4 Anticipates ascending steps
___ .5 Anticipates descending steps
___ .6 Assists with doors on his side
___ .7 Assists with door on guide's side
___ .8 Maintains alertness

19. USING TRAILING TECHNIQUES

___ .1 Uses appropriate hand
___ .2 Uses hand-fingers approved manner
___ .3 Discovers - avoids hazards

*This subscale was dropped since it proved to be too easy.

20. REVERSING ROUTES
___ .1 Travels straight line and reverses
___ .2 Route of one turn - reverse
___ .3 Route of one left - one right
___ .4 Reverses route

21. ENTERING - LEAVING AUTO
___ .1 Discovers direction car faces
___ .2 Enters - leaves independently
___ .3 Enters - leaves for maximum safety

22. CARDINAL DIRECTIONS
___ .1 Points out cardinal directions
___ .2 Direction familiar building faces
___ .3 Routes using cardinal directions

23. WALKING UP - DOWN STEPS
___ .1 Up with support
___ .2 Up without support
___ .3 Down without support
___ .4 Up alternating feet
___ .5 Down alternating feet

24. HOPPING AND SKIPPING
___ .1 Hops - one foot
___ .2 Hops - alternating feet
___ .3 Gallops
___ .4 Skips

25. RUNNING
___ .1 Runs with support
___ 2 Runs - one hand held
___ .3 Runs toward person
___ .4 Runs freely by himself

26. JUMPING
___ .1 Jumps off ground
___ .2 Jumps off step
___ .3 Jumps off wall
___ .4 Jumps coordinating movements

27. CLIMBING
___ .1 Climbs on sturdy object
___ .2 Climgs object - limited support
___ .3 Climbs up independently
___ .4 Climbs down independently

Administration Time: First Session______ Second Session_____
Total _______

EXAMINER'S OBSERVATIONAL RECORD AND COMMENTS

Child's Name ____________________

Sex	Birth Date	No.

Date __________________________

Subscale and Item	
	Note: This sheet was used by the Examiners to record significant observations regarding each subject's performance and the limitations of the Instrument.

1. SEATING ONESELF

1.1 SEATS SELF WHEN ONE HAND IS PLACED ON BACK OF CHAIR AND OTHER ON THE SEAT.

PROCEDURE: Use chair independent of table. Place one of child's hands on back of chair and the other on the seat.

Say, "Please sit down in this chair."

SCORE: Sits with back in correct relation to chair back; feet on or toward the floor.

1.2 SEATS SELF WHEN ONE HAND IS PLACED ON BACK OF CHAIR.

PROCEDURE: Use chair independent of table. Place one of child's hands on back of chair.

Say, "Please sit down in this chair."

SCORE: Same standards as Item 1.

1.3 SEATS SELF IN CHAIR, INDEPENDENTLY.

PROCEDURE: Place a chair in front of child.

Say, "There is a chair just in front of you. Please sit down."

SCORE: Same standards as Item 1.

1.4 SEATS SELF INDEPENDENTLY AT TABLE OR DESK FACING APPROPRIATELY FOR SITUATION.

PROCEDURE: Push chair seat under table at school or the dining table at home.

Say, "Please sit down at this table ready to work (eat)."

SCORE: Seats self facing table. Pulls chair up to within approximately one foot of the table.

2. USING FAMILIARIZATION TECHNIQUES

2.1 EXPLORES AREA WITH SIGHTED GUIDE

PROCEDURE: Choose a relatively unfamiliar furnished room (of average classroom or living room size). Child and examiner take a position in the doorway. Enumerate the objects in the room to the child.

Say, "Let's start here at the door and walk around and look at this room. Later I'm going to ask you about the things in the room." Walk about the room with the child. Encourage child to explore objects tactually in passing.

Say, "What does this feel like?" ("What is this object?") Correct any incorrect ideas. Encourage questions by the child.

SCORE: Child names at least five objects and/or asks relevant questions about the room and its contents.

2.2 TRAILS THE PERIMETER OF THE ROOM BY HIMSELF.

PROCEDURE: Use the same room explored in previous item.

Say, "Show me what you would do to find out about this room by yourself."

SCORE: Child goes around the perimeter of the room using acceptable trailing technique. Intermittent use of the correct technique constitutes success even though he interrupts to investigate objects.

2.3 CHECKS OR NOTES OBJECTS WITHIN REACH FROM A POINT ON THE PERIMETER OF THE ROOM.

PROCEDURE: Take the child to the perimeter of the room where there are objects (desk, chair, table) within reaching distance.

Say, "Tell me what is around you."

SCORE: Child locates two objects and identifies them.

2. USING FAMILIARIZATION TECHNIQUES

2.4 DEMONSTRATES AWARENESS OF SPATIAL PATTERN OF OBJECTS IN ROOM.

PROCEDURE: Use same room explored in previous item. Select a major item of furniture.

Say, "Find the (teacher's desk, sofa, table, bookshelf). Without looking around anymore, tell me ... What is beside it? Now what is in front of it? Behind it?" Require child to remain beside object selected while responding.

SCORE: Child locates selected object and names without touching appropriate objects in two of the three above positions.

2.5 DEMONSTRATES TWO METHODS OF ESTIMATING SIZE OF THE ROOM.

PROCEDURE: Use same room explored in previous item.

Say, "Can you show me one way you can get an idea about the size of this room? Can you tell me another way?"

SCORE: Demonstrates and describes. Walks length and width of test area. Describes the variation in echo or sound as a cue to size of the room. Must give both methods.

3. USING TACTUAL CUES

3.1 USES TOUCH TO DISTINGUISH GROSS DIFFERENCES IN TEXTURE.

MATERIALS: Three short pieces of wood.

PROCEDURE: Place the two smooth identical objects and one rough object before child.

Say, "Here are three pieces of wood. Give me the one that is different from the others."

SCORE: Child must hand examiner the roughly textured piece.

3.2 INVESTIGATES THROUGH TOUCH THE AREA WITHIN ARM'S REACH.

MATERIALS: Empty spool, bottle cap, round typewriter ribbon can.

PROCEDURE: Seat child at a table or on the floor. Place objects within arm's reach.

Say, "I am placing some objects on the (floor) (table) around you. Look at each one and tell me what it is like."

SCORE: Child handles and describes each object. Correct identification is not mandatory.

3.3 USES FEET TO DISTINGUISH SURFACE DIFFERENCES.

MATERIALS: Employ two contrasting surfaces such as uncarpeted to carpeted; wood to cement; cement to soil.

PROCEDURE: Say, "Walk along here and tell me when your feet feel something different."

SCORE: Reports change as he passes from one surface to the other.

3. USING TACTUAL CUES

3.4 MAKES DISCRIMINATIONS BETWEEN OBJECTS OF SIMILAR SURFACES OR TEXTURES.

MATERIAL: A wall with three distinct identifiable surfaces.

PROCEDURE: Have child walk past an area with such things as: a plastered wall; a closed door; a closed window; papered wall; bulletin board.

Say, "Walk along this wall. Feel it. Tell me when you find something different."

SCORE: Reports accurately when he comes to a different surface or texture on the wall. Naming of textures is not necessary.

3.5 MAKES DISCRIMINATIONS BETWEEN CLOTH OF SIMILAR TEXTURES.

MATERIALS: The three mounted samples of cloth.

PROCEDURE: Hand the child the mounted samples of cloth.

Say, "Here are three pieces of cloth of the same size. Find the one that is different."

SCORE: Indicates the piece of satin.

3.6 MAKES FINE DISCRIMINATIONS BETWEEN OBJECTS OF SIMILAR TEXTURES.

MATERIALS: Three mounted pieces of paper.

PROCEDURE: Hand the child the mounted samples of paper.

Say, "There are three pieces of paper pasted on this cardboard. Show me the one that is different."

SCORE: Indicates piece of newsprint.

4. WALKING

4.1 WALKS WITH SUPPORT.

PROCEDURE: Say, "There is nothing in your way. Walk across the room and back."

SCORE: Walks holding to objects.

Examiner may score Items 2 through 5.

4.2 WALKS WITHOUT SUPPORT.

Room (hallway) should afford enough open space to allow freedom of movement.

PROCEDURE: Say, "There is nothing in your way. Show me how you walk across the room without holding on to anything."
Child should take about 20 steps.

SCORE: Child walks without falling and without holding on to person or object.
Child may use hand and forearm technique. He may not use a guide.

4.3 WALKS WITH CROSS PATTERN.

PROCEDURE: Repeat instructions for Item 2 if necessary.

SCORE: Child alternates forward foot, shifting weight from one foot to the other.
Does not use waddling gait.
Child may use hand and forearm technique. He may not use a guide.

4. WALKING

4.4 WALKS WITH WEIGHT PROPERLY DISTRIBUTED.

PROCEDURE: Reassure child that the area is free of objects. Examiner should ask child to walk away from him and return if further observation is needed to score Items 4, 5 & 6.

SCORE: Child shifts weight from heel to toe as other foot comes forward. Does not shuffle, walk flat-footed, or with weight to side of foot. Child may use hand and forearm technique. He may not use a guide.

4.5 POINTS TOES IN DIRECTION OF TRAVEL.

SCORE: Child's feet point in direction of travel with less than an approximate 20° deviation. Child may use hand and forearm technique. He may not use a guide.

4.6 WALKS WITH RELAXED GAIT

SCORE: Steps are in proportion to size of child, neither too long nor too short. Steps are even and rhythmic. Arms swing in a natural manner.

5. USING DIRECTION TAKING

5.1 USES SOUND SOURCES TO ESTABLISH A COURSE OF STRAIGHT LINE TRAVEL TO AN OBJECT.

PROCEDURE: Select a room relatively familiar to the child. Take a position across the room from the child where he can move toward you in a straight line.

Say, "I am going to clap my hands several times. Walk over to me in a straight line."

Continue to clap hands at about the rate of once per second until child arrives.

SCORE: Child must arrive within approximately one foot either side of exact sound source.

5.2 DEMONSTRATES SQUARING OFF TECHNIQUE.

Testing room for Items 2,3,4,5 should be familiar to the child and provide space for him to move at least five paces to an object from the door.

PROCEDURE: Say, "Go to the door of this room and square off."

SCORE: Aligns body squarely with the door. Do not proceed to Items 3,4, and 5 if this item is failed.

5. USING DIRECTION TAKING

5.3 DETERMINES A DIRECTION OF TRAVEL IN RELATION TO A FIXED OBJECT.

PROCEDURE: Have child remain at door with which he has squared off.

Say, "Name an object in the room which is not directly in front of you, but to which you could go easily."

If object is directly in front of child or less than 5 paces away from him, ask child to name another object which is further away.
Examiner may suggest a goal. Make sure goal (object) selected will permit squaring off. See Item 5.

Say, "Turn toward the ------ (object)."

SCORE: Correctly aligns body at required angle to achieve direct line of travel to selected objective.

5.4 MOVES DIRECTLY TOWARD SELECTED GOAL UPON REQUEST.

PROCEDURE: Say, "Now go directly toward the ----- (object) until you can touch it."

SCORE: Reaches object selected and is able to make tactual contact with it.

5.5 RETURNS DIRECTLY TO STARTING POINT UPON REQUEST.

PROCEDURE: Go to child.

Say, "Now, go straight back to the door."

SCORE: Child turns, squares off with object, turns toward door, and returns directly within one foot of door.

6. USING SEARCH PATTERN

6.1 USES AUDITORY CUES TO PIN-POINT LOCATION OF DROPPED OBJECT.

MATERIALS: Four steel washers

PROCEDURE: Use room with hard surface floor. Stand beside child. Position of examiner remains fixed to avoid giving additional cues.

Say, "Here is a little steel circle." Allow child to examine washer. Say, "I am going to drop one of these to the floor. Listen and point to the spot where it stops."
Hold washer at waist height and drop at arms length distance in front of the child. Drop between examiner and subject to avoid masking sound.
Drop to either side and behind child, repeating instructions each time. Do not retrieve washers until all have been dropped.

SCORE: Child points accurately 3 out of 4 times.

6.2 STARTS AT POINT AND SWEEPS A WIDENING CIRCLE WITH ARM AND HAND.

MATERIALS: A steel washer.

PROCEDURE: Follow same procedure as in Item 1, but drop washer out of reach (approximately 4 feet).

Say, "Now, show me how you can find the circle."

SCORE: Child must demonstrate a correct circular search pattern. Score either Item 2 or 3, depending on pattern used.

6.3 USES A SQUARE PATTERN - MAKING HORIZONTAL OR OVERLAPPING SWEEPS.

MATERIALS: A steel washer.

PROCEDURE: Repeat procedure outlined in Item 2.

Say, "Can you show me another way of looking for the circle?"

SCORE: Child must demonstrate a correct square search pattern. Score Item 2 or 3, depending on pattern used.

6. USING SEARCH PATTERN

6.4 USES PROTECTIVE STOOPING TECHNIQUE IN STOOPING TOWARD OBJECT.

MATERIALS: A steel washer.

PROCEDURE: Use same procedure as outlined in Item 2. Drop the washer so that it goes under the table. Protect the child from bumping his head if it is obvious that he is not employing the protective technique.

Say, "Now it went under the table. See if you can find it."

SCORE: Child must demonstrate protective stooping technique. Retrieving washer not necessary.

7. USING DOORS AND WINDOWS

7.1 IDENTIFIES DOORS

PROCEDURE: Take child to door without glass panels. Allow child to explore the door.

Say, "What is this?"

SCORE: Correctly identifies the door.

7.2 IDENTIFIES WINDOWS

PROCEDURE: Take child to windows of a type common to the testing environment which he can reach easily.

Say, "What is this?" If child responds "glass", say, "Yes, but what is it?"

SCORE: Correctly identifies the window.

7.3 TELLS HOW DOORS FUNCTION.

PROCEDURE: Say, "Why do we have doors? How are they used?"

SCORE: Accept replies: "To go in and out; to close; an entrance."

7.4 TELLS HOW WINDOWS FUNCTION.

PROCEDURE: Say, "Why do we have windows? What are they for?"

SCORE: A source of air. If a child says, "A source of light," question him further in order to relate use to his needs.

7. USING DOORS AND WINDOWS

7.5 LOCATES AND DEMONSTRATES WORKING PARTS OF DOORS.

PROCEDURE: Say, "Where are the hinges? Tell me how they work."

SCORE: Child must locate the hinges and describe their function - i.e. "They allow the door to swing. It makes the door open."

7.6 LOCATES AND DEMONSTRATES WORKING PARTS OF WINDOWS.

PROCEDURE: Take child to window. Window may be sash, sliding or crank type.

Say, "Open and close window and tell me how it works."

SCORE: Successfully operates window and states it pushes up and down, goes in or out of slides. Where windows cannot be opened, a description of the process is acceptable.

7.7 USES KEY TO LOCK AND UNLOCK DOORS

MATERIALS: Key to selected door.

PROCEDURE: Say, "Here is the key to this door. Show me how to lock this door. Now, unlock it."

SCORE: Finds keyhole. Locks and unlocks door. Child need not remove the key.

8. USING RIGHT AND LEFT

8.1 DISTINGUISHES LEFT AND RIGHT ON OWN BODY.

PROCEDURE: Say, "Show me your right hand. Show me your left foot. Touch your left ear. Touch your right elbow (shoulder)."
The procedure may be repeated once if it seemed that an error was made due to momentary confusion.

SCORE: Shows the correct extremities.

8.2 RESPONDS CORRECTLY TO A COMMAND TO TURN LEFT.

PROCEDURE: Take child to open doorway. Say, "Let's look at this doorway." Allow him to explore the opening. Examiner stands approximately 3' from opening.

Say, "Now come back here where I am. I want you to go out of the door and turn left. Keep walking until I tell you when to stop."

SCORE: Makes left turn correctly. Walks several steps.

8.3 CORRECTLY DESCRIBES A FAMILIAR ROUTE IN TERMS OF RIGHT AND LEFT TURNS.

PROCEDURE: Select a short route known to the child which requires a right and a left turn.

Say, "Tell me how you would go from here to ----. Tell me which turns you must make."

SCORE: Describes route correctly using terms "right" and "left." If child responds in terms of a landmark, say, "Tell me in another way."

8. USING RIGHT AND LEFT

8.4 DISTINGUISHES LEFT AND RIGHT ON BODY OF ANOTHER PERSON.

If the child failed Item 8.1, do not administer this item.

PROCEDURE: Have child face examiner.

Say, "Take my left hand." Follow with, "Touch my right shoe."

SCORE: Touches correct extremities.

8.5 DISTINGUISHES RIGHT AND LEFT IN THE ENVIRONMENT.

PROCEDURE: Have the child stand so that a door is to his right side.

Say, "On which side of you is the door?" If child makes no response, or fails to use terms "right" or "left", say, "Is the door to your right or left?"

Say, "Turn around and face the opposite direction." After child turns, say, "On which side of you is the door?"

SCORE: Responds correctly to each question.

9. IDENTIFYING ESSENTIAL PARTS OF THE BODY

9.1 TOUCHES MOUTH UPON REQUEST.

PROCEDURE: Ask child to touch his mouth.

Say, "Touch your mouth."

SCORE: Touches mouth.

9.2 TOUCHES EXTREMITIES UPON REQUEST.

PROCEDURE: Ask child to show you his hands, then fingers, feet, then toes.

Say, "Show me your-----(hands, fingers, etc.)."

SCORE: Shows correctly the requested parts of the body.

9.3 TOUCHES DIFFERENT PARTS OF BODY UPON REQUEST.

PROCEDURE: Ask child to show you his waist, shoulder, knees and arm.

Say, "Show me your ----- (waist, shoulders, etc.)."

SCORE: Shows correctly the requested parts of the body.

9.4 IDENTIFIES BY NAMING ESSENTIAL PARTS OF BODY.

PROCEDURE: The examiner touches different parts of child's body and asks child to name them. Testing includes head, back, elbow, legs, neck, chest.

Say, "What is this?" while touching part of body.

SCORE: Child names selected body parts correctly.

10. PUTTING ON CLOTHING

10.1 PUTS ON SWEATER WITH ASSISTANCE.

MATERIALS: Cardigan

PROCEDURE: Hand child unbuttoned cardigan sweater so that he can easily take hold of neck side of shoulder.

Say, "Here is a sweater. Put it on."
Help child with second armhole if necessary.

SCORE: Child grasps sweater and puts one arm in correct armhole.
Examiner may administer Item 11.3 at this time.

10.2 PUTS ON SWEATER UNASSISTED.

PROCEDURE: Say, "Pick up the sweater from the chair and put it on."

SCORE: Child puts sweater on correctly without assistance.

10.3 BUTTONS SWEATER.

PROCEDURE: Have child keep sweater on.

Say, "Button it up."

SCORE: Starts at top or bottom and buttons three out of five buttons in corresponding holes.
Examiner may administer Item 11.5 at this time.

10.4 PUTS ON SWEATER UNASSISTED WHEN ONE SLEEVE HAS BEEN TURNED INSIDE OUT.

PROCEDURE: Turn one sleeve inside out. Place sweater on table.

Say, "Now, this will be harder. See if you can put this sweater on."

SCORE: Child turns sleeve right side out. Puts sweater on correctly without assistance.

10. PUTTING ON CLOTHING

10.5 PUTS ON BELT AND FASTENS BUCKLE CORRECTLY.

MATERIAL: Belt

PROCEDURE: Hand the child the belt.
Say, "Put this belt on and buckle it up."

SCORE: Fastens buckle so that it does not slip.

10.6 PUTS ON ZIPPERED JACKET WITHOUT ASSISTANCE.

MATERIAL: Jacket with zipper.

PROCEDURE: Give child zippered windbreaker.
Say, "See if you can put this on by yourself, and zip it up."

SCORE: Puts jacket on correctly and zips front zipper.

10.7 TIES BOWKNOTS CORRECTLY.

MATERIAL: Shoes with strings.

PROCEDURE: Say, "Untie your shoe and show me how you tie a bowknot."

SCORE: Successfully ties bowknots.

11. REMOVING CLOTHING

11.1 TAKES OFF OXFORDS WITH ASSISTANCE.

MATERIALS: Oxfords or tennis shoes which the child is wearing.

PROCEDURE: Say, "Can you take off your shoes? Show me." Untie shoes and loosen laces if child needs this assistance.

SCORE: Child removes shoes.
Examiner may score Item 2.

11.2 TAKES OFF OXFORDS UNASSISTED.

MATERIALS: Oxfords or tennis shoes which the child is wearing.

PROCEDURE: Say, "Can you take off your shoes? Show me."

SCORE: Child removes shoes.

11.3 REMOVES SWEATER WITHOUT ASSISTANCE.

PROCEDURE: Say, "Show me how you take off your sweater."

SCORE: Child removes unbuttoned sweater with no help from the examiner.

11.4 REMOVES ZIPPERED JACKET WITHOUT ASSISTANCE.

PROCEDURE: Child must be wearing zippered jacket to test this item.
Say, "Unzip your jacket and take it off."

SCORE: Child unzips jacket and removes it without assistance.

11.5 UNBUTTONS FRONT BUTTONS.

PROCEDURE: When child has cardigan sweater on, say, "Unbutton this sweater and take it off." Buttons should be the size of a dime or larger.

SCORE: Unbuttons all buttons and removes sweater without assistance.

12. UNDERSTANDING TURNS

12.1 MAKES COMPLETE TURN IN PLACE.

PROCEDURE: Have child stand facing examiner.

Say, "Turn all the way around and face me again."

SCORE: Turns approximately 360°

12.2 TURNS TO FACE OPPOSITE DIRECTION.

Say, "Turn around with your back to me."

SCORE: Turns approximately 180°

12.3 MAKES QUARTER TURN.

PROCEDURE: Now say, "Turn so that your side is toward me."

SCORE: Turns approximately 90°

12.4 TURNS TO ESTABLISH A DIAGONAL LINE OF TRAVEL

PROCEDURE: Position the child in the center of one wall of the room.

Say, "You are standing with your back to the wall and you are now facing the wall on the other side of the room. You are just as far from one corner of the opposite wall as you are from the other corner of the opposite wall. Turn and walk toward either of the corners of the opposite wall."

SCORE: Successfully turns and moves toward one of the opposite corners.

12.5 TURNS APPROXIMATE ANGLES REQUESTED WHEN DIRECTIONS ARE STATED IN DEGREES.

PROCEDURE: Say, "Turn 360°; 180°; 90°; 45°".

SCORE: Approximates angles of each turn. (Circle those passed)

13. USING THE TELEPHONE

13.1 USES AUDITORY CUES TO RECOGNIZE THE TELEPHONE.

PROCEDURE: Test where a telephone bell can be heard. If needed take child to school office; arrange for a call when possible.

SCORE: Child correctly recognizes the telephone.

13.2 ANSWERS THE TELEPHONE.

PROCEDURE: Take child to telephone.

Say, "Pretend the telephone is ringing. Show me how you would answer it."

SCORE: Picks up telephone placing earpiece to ear; mouthpiece to mouth.

13.3 PLACES CALLS INDEPENDENTLY BY USING THE OPERATOR.

PROCEDURE: Have child choose a person he wishes to call.

Say, "Show me how you can make a telephone call without dialing the numbers yourself."

SCORE: Child dials Operator. Reports he is blind. Requests Operator to place call to the person he names.

13.4 DIALS NUMBERS SUCCESSFULLY.

PROCEDURE: Say, "Now I want you to dial a number. Please dial 1 - 9 - 6 - 3." Repeat the numbers if necessary.

SCORE: Dials successfully using any method, such as touch method or counting method.

14. HANDLING SIMPLE TOOLS AND MATERIALS.

14.1 EFFICIENTLY LOCATES TOOLS AND MATERIALS.

PROCEDURE: Seat child at a table or desk.

Say, "Put your hands in your lap. I am putting a book and some other things on the table. Show me the best way to find the book."

SCORE: Child uses edge of desk or table as a reference point. Moves hand across surface of table or desk, using light searching touch. Locates requested item.

14.2 PLACES TOOLS OR MATERIALS IN AN EFFICIENT ORDER FOR USE.

PROCEDURE: Place the hammer, the 5 nails and the two pieces of soft pine before the child.

Say, "Put your hands in your lap. I am putting a hammer, some nails and some pieces of wood in front of you. Pretend you are going to hammer two nails in one board and then two in the other. Get yourself ready to work."

SCORE: Child rearranges materials in a pattern or order which allows him to reuse the materials with no gross tactual searching.

14.3 RETURNS MATERIALS AND/OR TOOLS TO SPECIFIC PLACES.

PROCEDURE: Place the box with three compartments in front of child. In first compartment place a spool and in the third a scissors, leave the second empty.

Say, "Here is a box with three sections or places. There is a spool in one and a scissors in another. Take them out and put them on the table." After child has done this, say, "Now, see if you can return them to the same places in the box."

SCORE: Child replaces spool in first section and scissors in third section of the box.

14. HANDLING SIMPLE TOOLS AND MATERIALS

14.4 IDENTIFIES SIMPLE TOOLS.

PROCEDURE: Hand child, in turn: a pliers, a braille ruler, a screw driver, and a small hand saw.

Say for each, "What is this and how do we use it?"

SCORE: Child correctly names or demonstrates (pantomimes) use of three out of four of the tools.

14.5 USES HELPING HAND EFFICIENTLY.

PROCEDURE: Give child a paper with the free form pattern firmly clipped to it.

Say, "Use this marking wheel and draw around this pattern."

SCORE: Child draws with dominant hand and uses other hand as a guide to follow line of pattern.

15. AUDITORY CUES - LOCALIZES SOUNDS

15.1 LOCALIZES SOUND BY POINTING TO SOURCE.

MATERIAL: Bell

PROCEDURE: Stand beside child.

Say, "I have a bell. I'm going to ring it several times. Point to it each time."

Ring the bell approximately two feet in front of the child. After he responds, ring bell to his right, to his left, and behind him.

SCORE: Accurately points to sound source each time.

15.2 USES A DOMINANT AUDITORY CUE SELECTED FROM THE ENVIRONMENT.

PROCEDURE: Choose a destination to which more than one sound cue could help the child, e.g. children on the playground, traffic, ventilator fan, sound from typewriter.

Say, "Go toward the ----." When child has done this, say, "Which sound helped you most? Why?"

SCORE: Accurately describes sound cue and indicates why it was dominant. (e.g. loudest, most continuous, etc.)

15.3 USES MULTIPLE AUDITORY CUES

PROCEDURE: Choose a route on which two or more sound cues are available to guide the child. Destination should lie in the direction of the sound sources.

Say, "Walk toward the ---." When child has done this, say, "What sounds did you use?" If child mentions only one sound say, "Were there any other sounds which helped you?"

SCORE: Accurately describes two or more sound cues used to reach objective.

15. AUDITORY CUES - LOCALIZES SOUNDS

15.4 USES AUDITORY CUES TO ESTABLISH AND MAINTAIN A PARALLEL LINE OF TRAVEL.

PROCEDURE: Take child to street where there is traffic. Start in center of the sidewalk.

Say, "Show me how you can walk along here without using a guide line."

SCORE: Does not use guide line but successfully maintains an approximately parallel line of travel, correcting errors so that he does not leave the sidewalk.

16. AUDITORY CUES - IDENTIFIES SOUNDS

16.1 IDENTIFIES VOICES OF PEOPLE WELL-KNOWN TO HIM.

PROCEDURE: Say, "Three people will talk to you. Tell me the name of each one when he talks." Have each of the three speak in turn.

SCORE: Accurately identifies the three children.

16.2 IDENTIFIES COMMON SOUNDS PRESENT IN THE ENVIRONMENT.

MATERIAL: One piece of ditto paper, playground whistle, bell.

PROCEDURE: Take a position across the room from the child.

Say, "I am going to make some sounds. Tell me what each one is."
Clap hands, footsteps, bell, opening door, playground whistle, crumple paper.

SCORE: Accurately identifies 5 out of 6 sounds.

16.3 IDENTIFIES OBJECTS AS SOUND SOURCES DURING TRAVEL.

PROCEDURE: Walk with child along route which will afford more than three sounds.

Say, "Tell me each sound you hear as we walk along."

SCORE: Correctly identifies three different sound sources as he walks. (e.g. car passing, footsteps, voices, etc.)

17. AUDITORY CUES - USES SOUNDS IN TRAVEL

17.1 USES A SOUND CUE AS A LANDMARK

PROCEDURE: Take child to environment in which a definite sound cue is available as a landmark (e.g.- clock emitting regular sounds, traffic on a street, running drinking fountain, playground always occupied at a particular time of day, ventilator, etc.)

Say, "Where are we standing now? Tell me how you know where we are. Name as many ways as you can." If child does not give sound cue, ask: "Are there any other ways?"

SCORE: Child names sound cue which serves as landmark.

17.2 USES VARIATION IN INTENSITY OF SOUND CUE AS AN INDICATION OF A MOVING SOUND SOURCE.

PROCEDURE: Stand at the curb of a street.

Say, "Tell me when you hear a car (bus, truck) coming. Point in the direction of the sound and move your hand to show me when it passes by and goes on."

SCORE: Accurately indicates approach and passing of vehicle.

17.3 USES VARIATION IN INTENSITY OF SOUND CUE TO DETERMINE WHETHER HE IS MOVING TOWARD A STATIONARY SOUND SOURCE OR AWAY FROM IT.

PROCEDURE: While walking with child select and agree upon a sound toward which you are moving.

Say, "Is that ---- (name stationary sound source) ahead of you or behind you?"
If child answers correctly, say, "Tell me when we pass the ---- (sound source)."

SCORE: Accurately describes location of sound source in relation to self.

17. AUDITORY CUES - USES SOUNDS IN TRAVEL

17.4 DETECTS PRESENCE OF LARGE OBJECT IN ENVIRONMENT.

PROCEDURE: Walk with child on the playground. Walk toward a large object, i.e. a handball court backstop, a solid fence or a building.

Say, "Tell me when we get near the ----." (name object)

SCORE: Detects object without physical contact.

17.5 DEMONSTRATES USE OF ECHO FOR OBJECT DETECTION.

PROCEDURE: Use same environment as in Item 17.4. Attempt to determine whether the use of an echo was a factor in detection.

Say, "How did you know when you were by the ----?" If child does not mention echo, say, "Are there any other ways you could tell?"

SCORE: Child refers to specific sound which produced echo; child created sound to receive echo.

17.6 DETECTS OBJECT WHICH PRODUCES A SOUND SHADOW.

PROCEDURE: Take child to street where there is traffic with utility poles or trees along the street.

Say, "Tell me when you think there is anything between you and the traffic."
Say, "How did you know?"

SCORE: Mentions that utility poles or other objects such as parked cars block the sound of traffic.

18. USING SIGHTED GUIDE

18.1 CORRECTLY GRASPS SIGHTED GUIDE'S ARM.

PROCEDURE: Select in advance a route which will afford the following features; an uncrowded corridor, a crowded area, at least three steps up and down, a closed door opening on child's side, a closed door opening on guide's side, and a definite turn in either direction. These situations are adequate for observing the child's performance as a basis for scoring Items 2-3-4-5-6.

Say, "Let's go for a walk. Take my arm and show me how you walk with a sighted guide."

SCORE: Thumb just above elbow, fingers on body side.
If child succeeds in Item 18.1, examiner may score Items 2-3-4-5-6.
If child fails omit remaining items.

18.2 WALKS CORRECTLY WITH GUIDE UNDER NORMAL CONDITIONS.

SCORE: Child walks to side and one half pace behind guide.

18.3 USES POSITIONAL CUES AND MOVEMENT OF SIGHTED GUIDE IN CROWDED AREAS.

PROCEDURE: Approach crowded area or a narrow passage may be substituted if crowd is not available.
Move the elbow of the arm the child is grasping toward the center of your back.
Do not warn child in advance.

SCORE: Child extends arm and moves directly behind guide on signal.

18. USING SIGHTED GUIDE

18.4 USES MOVEMENT OF SIGHTED GUIDE TO ANTICIPATE ASCENDING STEPS.

PROCEDURE: Approach ascending steps; do not warn child. Step up. If a series of steps is not available, use a curb two times.

SCORE: Child, walking a half pace behind guide, feels guide's upward movement and also steps up.

18.5 USES MOVEMENT OF SIGHTED GUIDE TO ANTICIPATE DESCENDING STEPS.

PROCEDURE: Approach descending steps; do not warn child. Step down. If a series of steps is not available, use a curb two times.

SCORE: Child feels guide's movement and steps down.

18.6 ASSISTS IN OPENING AND CLOSING DOORS WHICH OPEN ON HIS SIDE.

PROCEDURE: Open a closed door which swings to child's side.

SCORE: Child drops one pace behind when guide opens a door and holds it open for both to pass through. If it is not a self-closing door, the child closes the door when both have passed through.

18.7 ASSISTS IN OPENING AND CLOSING DOOR WHICH OPENS ON GUIDE'S SIDE.

PROCEDURE: Open a door which opens on guide's side. If none is available, change sides with child.

SCORE: Child momentarily grasps guide's other arm with his opposite hand and extends his arm so that he may hold the door open with the other hand. If the door is not self-closing, the blind child closes it.

18. USING SIGHTED GUIDE

18.8 MAINTAINS OWN ALERTNESS AND ORIENTATION.

PROCEDURE: As you walk, make a turn.

Say, "Which way did we turn?"

SCORE: Child responds by either naming cardinal direction; right or left; or indicates he is moving toward a particular place or landmark.

19. USING TRAILING TECHNIQUES

19.1 USES APPROPRIATE HAND TO TRAIL.

PROCEDURE: Select route along a corridor where there are at least two doors, one of which should be open, and an object which is waist high, such as a drinking fountain or a trash barrel.

Say, "Trail along this wall until I tell you to turn around and come back."
When child has passed the last object, say, "Now trail back on the same side of the hall."

SCORE: Uses right hand when wall or other object is on his right; uses left hand when wall or objects are on his left.
Child may employ non-trailing hand in a protective manner as long as he does not touch the wall with it.
If child succeeds, examiner may score Items 19.2 and 19.3.
If child fails, omit remaining items.

19.2 USES HAND AND FINGERS IN APPROVED MANNER.

PROCEDURE: Examiner may repeat instructions if necessary.

SCORE: Holds hand forward of the hip,back of fingers contacting wall or other object. Fingers point down and slightly to the rear.

19.3 TRAILS EFFICIENTLY, DISCOVERING AND AVOIDING HAZARDS.

PROCEDURE: Examiner may repeat instructions if necessary.

SCORE: Avoids objects by going around them without bumping.

20. REVERSING ROUTES

20.1 TRAVELS STRAIGHT LINE ROUTE AND REVERSES IT.

PROCEDURE: Take child across the room from a door. Have him stand by a chair facing the door.

Say, "You are facing the door; there is nothing in the way. Please walk to the door and back."

Avoid giving child an auditory cue by not speaking to him after he has started.

SCORE: Walks straight to any part of the door; turns around and returns to starting point. Makes contact with chair.

20.2 TRAVELS ROUTE WITH ONE TURN AND REVERSES IT.

PROCEDURE: Have the child stand by the chair facing door.

Say, "Go through the door; turn either way; walk until I tell you to stop. Remember how you go so that you can come back the same way."
Follow the child. When he has walked ten paces, say, "Now, return to the chair the same way you came."

SCORE: Goes out the door; turns, walks approximately ten paces; returns to chair by same route reversing direction of turn and order of landmarks he may have used.

20.3 TRAVELS ROUTE INVOLVING A COMBINATION OF ONE LEFT AND ONE RIGHT TURN.

PROCEDURE: Have child stand by the chair, facing the door. Agree upon an object a few paces to the left of the door, such as drinking fountain, another door, etc., which does not give a directional cue.

Say, "Go through the door and make a left turn. Walk to the ---- (name object) and make a right turn. Keep walking until I tell you to stop."
As long as one left and one right turn are required, the order is unimportant. Walk about ten paces behind the child, but do not help him physically or verbally. When child has completed route, go to him.

SCORE: Child follows prescribed route without help.

20. REVERSING ROUTES

20.4 REVERSES ABOVE ROUTE.

PROCEDURE: Stand beside child where he finished route described in 3.

Say, "Go back to the chair the same way you came." If child approaches task carelessly. Repeat command. Follow child, but give no help.

SCORE: Child reverses turns and landmarks he used and returns to chair in the examining room.

21. ENTERING AND LEAVING AN AUTOMOBILE

21.1 DISCOVERS FOR HIMSELF WHICH DIRECTION CAR IS FACING.

PROCEDURE: Take child to passenger car. Car must not be parked in a spot which reveals the direction, i.e. a stall in front of the building, on a one way street. Stop about half-way between the front and the rear of the car and arm's length away from it.

Say, "Here is a car. Find the front of the car. How can you tell?"

SCORE: Correctly identifies the front of the car in first response, using any safe method.

21.2 ENTERS AND LEAVES CAR INDEPENDENTLY, USING ANY METHOD.

PROCEDURE: Take child to right front door.

Say, "Here is the right front door. Let's see you get into the car and sit down. Now, get out again."

SCORE: Opens door and gets in and out in any fashion. Examiner may score Item 21.3.

21.3 ENTERS AND LEAVES CAR INDEPENDENTLY IN MANNER RECOMMENDED FOR MAXIMUM SAFETY.

PROCEDURE: Use procedure for Item 21.2.

SCORE: Opens door; places one hand on inside door handle the other on top of door jamb. Reverses technique in getting out.

22. CARDINAL DIRECTIONS

22.1 POINTS OUT CARDINAL DIRECTIONS IN A FAMILIAR SETTING.

PROCEDURE: Say, "You are being turned to face the north." Face child to north. "Now face east - Now west - Now south."

SCORE: Child faces correct directions each time. If child becomes confused, stop and repeat the entire procedure once.

22.2 KNOWS THE DIRECTION A FAMILIAR BUILDING FACES.

PROCEDURE: Say, "What direction does the front of your school face?"
If child fails to give a cardinal direction, say, "Is that north, east, south or west?"

SCORE: Gives correct direction.

22.3 TRAVELS A ROUTE WITH ONE TURN DESCRIBED IN TERMS OF CARDINAL DIRECTIONS.

PROCEDURE: Use a short hallway in school building or the sidewalk in front of the building. Face the child to the south.

Say, "You are now facing south. Walk until I say, 'turn' - then turn to the east."

SCORE: Child makes correct directional turn.

23. WALKING UP AND DOWN STEPS

23.1 WALKS UP AND DOWN STEPS WITH SUPPORT.

PROCEDURE: Take child to staircase of at least four steps which has at least one railing.

Say, "Let's see how you walk up the stairs." When child completes the task say, "Now come down."

SCORE: Child walks up steps. Turns around and comes down. He may use railing or wall for support.
Examiner may score Items 2 through 5.

23.2 WALKS UP STEPS ONE FOOT AT A TIME WITHOUT SUPPORT.

PROCEDURE: Say, "Now walk up the steps without holding on."

SCORE: Child walks up steps one foot at a time without support.
Examiner may score Item 4.

23.3 WALKS DOWN STEPS ONE FOOT AT A TIME - WITHOUT SUPPORT.

PROCEDURE: Child is at top of steps.

Say, "Now walk down."

SCORE: Child walks down one foot at a time without support.
Examiner may score Item 5.

23.4 WALKS UP STEPS ALTERNATING FORWARD FOOT, ONE FOOT PER TREAD.

PROCEDURE: Say, "Walk up these steps."

SCORE: Child walks up steps alternating forward foot, one foot per tread.

23.5 WALKS DOWN STEPS, ALTERNATING FORWARD FOOT, ONE FOOT PER TREAD.

PROCEDURE: Say, "Now, walk down."

SCORE: Child walks down steps alternating forward foot, one foot per tread.

24. HOPPING AND SKIPPING

24.1 HOPS ON ONE FOOT.

PROCEDURE: Say, "Show me how you can hop. Hop until I tell you to stop."

SCORE: Child hops at least three times on one foot.

24.2 HOPS, ALTERNATING FEET.

PROCEDURE: Say, "Now hop first on one foot and then on the other one. I'll tell you when to stop."

SCORE: Child hops first on one foot; then on the other. Alternates three times.

24.3 GALLOPS.

PROCEDURE: Have child walk about an unobstructed area about thirty feet long.
When he has done this, say, "There is nothing in the way, is there?" "Now show me how you can gallop." Tell child to stop after about 10 steps.

SCORE: Child clearly demonstrates galloping pattern.

24.4 SKIPS.

PROCEDURE: Say, "Now, show me how you can skip." Tell child to stop after about 10 steps.

SCORE: Child clearly demonstrates skipping pattern.

25. RUNNING

25.1 RUNS WITH SUPPORT FROM EACH SIDE.

PROCEDURE: Examiner takes one of child's hands; have another person of approximately the same height as examiner take the other hand.

Say, "Let's see you run with us."
Run approximately 20 feet.

SCORE: Runs without dragging his feet.

25.2 RUNS WITH ONE HAND HELD.

PROCEDURE: Ask child to run with you or with a sighted playmate. Take his hand and run approximately 20 feet.

SCORE: Runs without dragging feet.

25.3 RUNS TOWARD ANOTHER PERSON.

PROCEDURE: Say, "I am going to move away from you now. When I say 'come to me' I want you to run to me."

Examiner moves approximately 20' away from child and gives the command: "Run over here."

SCORE: Runs in direction of examiner.

25.4 RUNS FREELY BY HIMSELF.

PROCEDURE: Have child walk about an unobstructed area about thirty feet long. When he has done this, say, "There is nothing in the way, is there? Show me how fast you can run."

Tell child to stop when he has demonstrated apparent top speed.

SCORE: Runs without apparent restraint - arms moving freely, body thrust forward.
If child runs freely, but with arms in a protective position, score minus, but note behavior.

26. JUMPING

26.1 JUMPS - BOTH FEET OFF THE GROUND

PROCEDURE: Say, "Show me how you jump up and down."

SCORE: Both feet off the ground at the same time.

26.2 JUMPS OFF STEP.

PROCEDURE: Say, "Now stand on this bottom step (or a single step) and jump off."

26.3 JUMPS OFF LOW WALL OR BENCH.

MATERIALS: Use a low wall or bench approximately 18" high.

PROCEDURE: Say, "Here is a (low wall) (bench) -- Look at it."
Allow child to explore bench or low wall tactually and climb upon it.
"Now, show me how you can jump off of it."

SCORE: Jumps without falling.

26.4 JUMPS, COORDINATING OTHER BODY MOVEMENTS.

PROCEDURE: Say, "Jump and clap your hands over your head at the same time. (Or, "Do the jumping jack.") Do it until I tell you to stop."
Demonstrate if necessary.

SCORE: Three jumps, coordinated, hands clapping overhead when feet are off ground.

27. CLIMBING

27.1 CLIMBS ON STURDY OBJECT

MATERIAL: Use overstuffed chair or davenport.

PROCEDURE: Say, "Can you climb up on this (chair or davenport)?"

SCORE: Successfully climbs object indicated on first trial without falling back.

27.2 CLIMBS UPON OBJECTS OFFERING LIMITED SUPPORT.

MATERIAL: School or dining room type chair.

PROCEDURE: Say, "Let's see you climb up on this chair all by yourself."

SCORE: Climbs successfully without falling back. Acceptable to kneel on chair.

27.3 CLIMBS PLAY EQUIPMENT INDEPENDENTLY.

MATERIAL: Playground jungle gym with at least three rungs.

PROCEDURE: Say, "Show me how you climb the jungle gym."

SCORE: Climbs two rungs successfully without verbal or physical assistance.

27.4 CLIMBS DOWN PLAY EQUIPMENT INDEPENDENTLY.

PROCEDURE: Say, "Now climb down."

SCORE: Climbs down without verbal or physical assistance.

APPENDIX C

DISTRIBUTION OF SUBJECTS BY TYPE OF PROGRAM

Schools or Programs		Subjects Tested	
PRESCHOOL PROGRAMS (Children under six)*			
Delta Camma, St. Louis	(Home)	4	
Kansas City, Missouri	(Home)	3	
Michigan	(Residential)	1	
Michigan	(Public School)	2	
New Jersey Commission	(Home)	7	
New York City	(Home)	1	
Northern California	(Home)	5	
Overbrook	(Residential)	2	
Portland	(Home)	1	
Southern California	(Home)	6	
Washington	(Residential)	1	
			33
DAY SCHOOLS			
Azusa, California		2	
Bakersfield, California		5	
Garden Grove, California		3	
Glendale, California		3	
Long Beach, California		5	
Los Angeles, California		16	
Midway City, California		5	
Norwalk, California		1	
San Diego, California		5	
San Francisco, California		1	
Santa Monica, California		2	
Temple City, California		5	
Ventura, California		1	
Whittier, California		5	
Michigan, Detroit and Wayne County		9	
Kansas City, Missouri		6	
St. Louis County, Missouri		4	
New Jersey Commission		2	
New York City, N.Y., P.S. 199, 307		4	
Portland, Oregon		4	
			88
RESIDENTIAL			
California, Berkeley		10	
Illinois, Jacksonville		4	
Michigan		7	
Missouri, St. Louis		13	

New York, New York City (Lavelle)	3
Oregon, Salem	6
Overbrook, Pennsylvania	3
Washington, Vancouver	6
	52
	173

*Type of preschool program is shown in parentheses; home refers to children being served by a preschool counselor.

APPENDIX DI

DISTRIBUTION OF RESPONSES ON ALL ITEMS FOR EACH AGE LEVEL

		Ages									
Items		3	4	5	6	7	8	9	10	11	12
1.1	Pass	4	13	17	16	19	24	20	20	15	25
	Fail	0	0	0	0	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
1.2	Pass	4	13	17	16	19	24	20	20	15	25
	Fail	0	0	0	0	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
1.3	Pass	4	13	17	16	19	24	20	20	15	25
	Fail	0	0	0	0	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
1.4	Pass	4	13	17	16	19	24	20	20	15	25
	Fail	0	0	0	0	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
2.1	Pass	4	13	17	16	18	24	20	20	15	25
	Fail	0	0	0	0	0	0	0	0	0	0
	N.O.	0	0	0	0	1	0	0	0	0	0
2.2	Pass	0	0	0	1	1	1	3	1	3	5
	Fail	4	13	17	15	17	23	17	19	12	20
	N.O.	0	0	0	0	1	0	0	0	0	0
2.3	Pass	1	6	10	11	17	23	19	20	14	23
	Fail	3	7	7	5	1	1	1	0	1	2
	N.O.	0	0	0	0	1	0	0	0	0	0
2.4	Pass	0	0	5	6	7	9	12	12	7	11
	Fail	4	13	12	10	11	15	8	8	8	14
	N.O.	0	0	0	0	1	0	0	0	0	0
2.5	Pass	0	0	0	0	0	0	1	2	0	2
	Fail	4	13	17	16	18	24	19	18	15	23
	N.O.	0	0	0	0	1	0	0	0	0	0
3.1	Pass	1	6	14	15	18	23	17	18	15	24
	Fail	3	7	3	1	1	1	3	2	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
3.2	Pass	2	8	13	14	17	24	20	20	15	25
	Fail	2	5	4	2	2	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
3.3	Pass	2	8	16	16	19	23	20	20	15	24
	Fail	2	5	1	0	0	1	0	0	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
3.4	Pass	2	8	16	15	19	24	20	20	15	25
	Fail	2	5	1	1	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
3.5	Pass	0	4	13	14	15	22	18	19	15	25
	Fail	4	9	4	2	4	2	2	1	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
3.6	Pass	0	1	7	10	14	18	16	16	13	18
	Fail	4	12	10	6	5	6	4	4	2	7
	N.O.	0	0	0	0	0	0	0	0	0	0
4.1	Pass	4	13	17	16	19	24	20	20	15	25
	Fail	0	0	0	0	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0

Appendix D1 Continued

Items		Ages									
		3	4	5	6	7	8	9	10	11	12
4.2	Pass	4	13	17	16	19	24	20	20	15	25
	Fail	0	0	0	0	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
4.3	Pass	4	13	17	16	19	24	20	20	14	25
	Fail	0	0	0	0	0	0	0	0	1	0
	N.O.	0	0	0	0	0	0	0	0	0	0
4.4	Pass	2	4	9	8	10	11	11	11	7	14
	Fail	2	9	8	8	9	13	9	9	8	11
	N.O.	0	0	0	0	0	0	0	0	0	0
4.5	Pass	3	6	9	12	10	12	7	12	4	11
	Fail	1	7	8	4	9	12	13	8	11	14
	N.O.	0	0	0	0	0	0	0	0	0	0
4.6	Pass	2	3	6	6	9	8	3	8	2	7
	Fail	2	10	11	10	10	16	17	12	13	18
	N.O.	0	0	0	0	0	0	0	0	0	0
5.1	Pass	2	12	16	16	19	24	20	20	15	24
	Fail	2	1	1	0	0	0	0	0	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
5.2	Pass	0	0	0	1	0	2	3	2	3	2
	Fail	4	13	17	15	19	22	17	18	12	23
	N.O.	0	0	0	0	0	0	0	0	0	0
5.3	Pass	0	0	0	1	0	2	4	2	2	5
	Fail	4	13	17	15	19	22	16	18	13	20
	N.O.	0	0	0	0	0	0	0	0	0	0
5.4	Pass	0	0	0	1	0	2	3	2	1	3
	Fail	4	13	17	15	19	22	17	18	14	22
	N.O.	0	0	0	0	0	0	0	0	0	0
5.5	Pass	0	0	0	0	0	1	3	0	0	3
	Fail	4	13	17	16	19	23	17	20	15	22
	N.O.	0	0	0	0	0	0	0	0	0	0
6.1	Pass	4	11	17	15	18	24	19	20	15	24
	Fail	0	2	0	1	1	0	1	0	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
6.2	Pass	0	0	0	0	0	1	2	1	0	3
	Fail	4	13	17	16	19	23	18	19	15	22
	N.O.	0	0	0	0	0	0	0	0	0	0
6.3	Pass	0	0	0	0	0	0	0	0	0	0
	Fail	4	13	17	16	19	24	20	20	15	25
	N.O.	0	0	0	0	0	0	0	0	0	0
6.4	Pass	0	0	0	0	0	0	2	0	2	1
	Fail	4	13	17	16	19	24	18	20	13	24
	N.O.	0	0	0	0	0	0	0	0	0	0
7.1	Pass	3	13	17	16	19	24	20	20	15	25
	Fail	1	0	0	0	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
7.2	Pass	3	13	17	16	19	24	20	20	15	25
	Fail	1	0	0	0	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
7.3	Pass	1	3	7	5	11	12	16	8	9	19
	Fail	3	10	10	11	8	12	4	12	6	6
	N.O.	0	0	0	0	0	0	0	0	0	0

Appendix Dl Continued

Items		Ages									
		3	4	5	6	7	8	9	10	11	12
7.4	Pass	0	2	5	6	11	14	11	10	9	15
	Fail	4	11	12	10	8	10	9	10	6	10
	N.O.	0	0	0	0	0	0	0	0	0	0
7.5	Pass	0	1	7	5	10	14	13	16	13	18
	Fail	4	12	10	11	9	10	7	4	2	7
	N.O.	0	0	0	0	0	0	0	0	0	0
7.6	Pass	2	3	10	10	15	21	16	20	11	16
	Fail	2	10	7	6	4	1	4	0	0	7
	N.O.	0	0	0	0	0	2	0	0	4	2
7.7	Pass	0	0	3	4	4	7	11	10	6	18
	Fail	4	13	11	10	9	8	3	4	3	4
	N.O.	0	0	3	2	6	9	6	6	6	3
8.1	Pass	1	6	16	14	16	23	19	19	15	25
	Fail	3	7	1	2	3	1	1	1	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
8.2	Pass	0	4	15	11	16	23	19	19	15	24
	Fail	4	9	2	5	3	1	1	1	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
8.3	Pass	0	0	3	6	8	16	11	18	13	20
	Fail	4	13	14	10	11	8	9	2	2	5
	N.O.	0	0	0	0	0	0	0	0	0	0
8.4	Pass	0	1	4	3	7	13	12	11	6	17
	Fail	4	12	13	13	12	10	8	9	9	8
	N.O.	0	0	0	0	0	1	0	0	0	0
8.5	Pass	1	5	15	11	15	23	18	20	15	24
	Fail	3	8	2	5	4	1	2	0	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
9.1	Pass	3	13	17	16	19	24	20	20	15	25
	Fail	1	0	0	0	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
9.2	Pass	3	13	17	16	19	24	20	20	14	25
	Fail	1	0	0	0	0	0	0	0	1	0
	N.O.	0	0	0	0	0	0	0	0	0	0
9.3	Pass	1	5	11	12	15	24	17	15	14	24
	Fail	3	8	6	4	4	0	3	5	1	1
	N.O.	0	0	0	0	0	0	0	0	0	0
9.4	Pass	0	5	11	10	9	18	12	13	8	15
	Fail	4	8	6	6	10	6	8	7	7	10
	N.O.	0	0	0	0	0	0	0	0	0	0
10.1	Pass	4	13	17	16	19	23	20	20	15	25
	Fail	0	0	0	0	0	1	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0
10.2	Pass	0	1	8	12	15	22	18	20	15	23
	Fail	4	12	9	4	4	2	2	0	0	2
	N.O.	0	0	0	0	0	0	0	0	0	0
10.3	Pass	0	2	7	10	14	21	20	18	14	24
	Fail	4	11	10	6	5	3	0	2	1	1
	N.O.	0	0	0	0	0	0	0	0	0	0
10.4	Pass	0	1	3	7	12	16	17	19	14	23
	Fail	4	12	14	9	7	8	3	1	1	2
	N.O.	0	0	0	0	0	0	0	0	0	0

Appendix Dl Continued

Items		3	4	5	6	7	8	9	10	11	12
10.5	Pass	0	1	4	7	8	17	14	18	13	20
	Fail	4	12	13	9	11	7	6	1	2	5
	N.O.	0	0	0	0	0	0	0	1	0	0
10.6	Pass	0	0	0	0	0	3	3	1	1	3
	Fail	3	7	7	4	1	3	3	1	1	3
	N.O.	1	6	10	12	18	18	14	18	13	19
10.7	Pass	0	1	0	4	3	13	8	13	8	16
	Fail	4	11	15	10	12	8	6	1	3	3
	N.O.	0	1	2	2	4	3	6	6	4	6
11.1	Pass	1	9	11	13	13	20	14	13	12	19
	Fail	3	2	3	0	0	1	0	0	0	1
	N.O.	0	2	3	3	6	3	6	7	3	5
11.2	Pass	0	7	10	11	13	19	14	13	12	19
	Fail	4	4	4	2	0	2	0	0	0	1
	N.O.	0	2	3	3	6	3	6	7	3	5
11.3	Pass	1	9	16	15	18	24	19	20	14	25
	Fail	3	4	1	1	1	0	1	0	0	0
	N.O.	0	0	0	0	0	0	0	0	1	0
11.4	Pass	1	2	5	3	1	5	5	1	2	5
	Fail	2	6	2	1	0	0	1	1	0	1
	N.O.	1	5	10	12	18	19	14	18	13	19
11.5	Pass	0	4	13	10	19	24	20	20	14	25
	Fail	4	9	4	6	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	1	0
12.1	Pass	0	6	17	12	19	23	18	19	15	24
	Fail	4	7	0	4	0	1	2	1	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
12.2	Pass	2	10	16	14	17	24	18	20	15	24
	Fail	2	3	1	2	2	0	2	0	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
12.3	Pass	1	8	16	12	17	24	18	20	15	24
	Fail	3	5	1	4	2	0	2	0	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
12.4	Pass	0	1	2	7	12	17	16	13	11	15
	Fail	4	12	15	9	7	7	4	7	3	10
	N.O.	0	0	0	0	0	0	0	0	1	0
12.5	Pass	0	0	0	1	0	1	1	4	1	6
	Fail	4	13	17	15	19	23	19	16	14	19
	N.O.	0	0	0	0	0	0	0	0	0	0
13.1	Pass	0	0	4	1	1	2	1	1	0	3
	Fail	0	1	0	0	0	0	0	0	0	1
	N.O.	4	12	13	15	18	22	19	19	15	21
13.2	Pass	3	10	16	13	19	23	20	20	14	25
	Fail	1	3	1	3	0	1	0	0	1	0
	N.O.	0	0	0	0	0	0	0	0	0	0
13.3	Pass	0	0	0	1	0	1	0	0	1	1
	Fail	4	13	17	15	19	23	20	20	14	24
	N.O.	0	0	0	0	0	0	0	0	0	0
13.4	Pass	0	1	0	3	4	12	11	16	12	17
	Fail	4	12	17	13	15	12	9	4	3	8
	N.O.	0	0	0	0	0	0	0	0	0	0

Appendix Dl Continued

Items	Ages									
	3	4	5	6	7	8	9	10	11	12
14.1 Pass	2	5	9	8	15	15	17	17	14	19
Fail	2	8	8	8	4	9	3	3	1	6
N.O.	0	0	0	0	0	0	0	0	0	0
14.2 Pass	0	1	1	0	0	2	1	2	1	4
Fail	4	12	16	16	19	22	19	18	14	21
N.O.	0	0	0	0	0	0	0	0	0	0
14.3 Pass	0	5	9	13	16	20	15	20	13	19
Fail	4	8	8	3	3	4	5	0	2	6
N.O.	0	0	0	0	0	0	0	0	0	0
14.4 Pass	0	6	6	11	16	22	15	19	13	20
Fail	4	7	11	5	3	2	5	1	2	5
N.O.	0	0	0	0	0	0	0	0	0	0
14.5 Pass	0	0	1	8	3	10	11	15	13	16
Fail	4	13	16	8	16	14	9	5	2	9
N.O.	0	0	0	0	0	0	0	0	0	0
15.1 Pass	3	10	9	8	11	16	13	18	9	23
Fail	1	3	8	8	8	8	7	2	6	2
N.O.	0	0	0	0	0	0	0	0	0	0
15.2 Pass	0	5	7	12	15	17	19	18	15	22
Fail	4	8	10	4	4	7	1	2	0	3
N.O.	0	0	0	0	0	0	0	0	0	0
15.3 Pass	0	1	2	4	3	7	10	9	10	13
Fail	4	12	15	12	16	17	10	11	5	11
N.O.	0	0	0	0	0	0	0	0	0	1
15.4 Pass	0	0	0	0	0	0	2	1	3	7
Fail	0	1	3	1	1	1	2	2	3	6
N.O.	4	12	14	15	18	23	16	17	9	12
*										
17.1 Pass	0	3	8	10	14	15	17	19	12	23
Fail	3	10	8	6	5	9	3	1	3	2
N.O.	1	0	1	0	0	0	0	0	0	0
17.2 Pass	0	3	13	13	16	17	19	17	14	23
Fail	1	3	1	0	1	0	0	0	1	1
N.O.	3	7	3	3	2	7	1	3	0	1
17.3 Pass	0	4	12	12	17	23	19	20	15	25
Fail	4	7	5	4	2	1	0	0	0	0
N.O.	0	2	0	0	0	0	1	0	0	0
17.4 Pass	2	8	15	15	18	24	20	19	14	25
Fail	2	5	2	1	1	0	0	1	1	0
N.O.	0	0	0	0	0	0	0	0	0	0
17.5 Pass	0	0	1	3	1	4	6	8	4	7
Fail	4	13	16	13	18	20	14	12	11	18
N.O.	0	0	0	0	0	0	0	0	0	0
17.6 Pass	0	0	0	0	0	0	0	1	2	8
Fail	0	2	2	1	2	3	4	2	8	9
N.O.	4	11	15	15	17	21	16	17	5	8
18.1 Pass	0	0	0	0	0	0	3	5	5	10
Fail	4	13	17	16	19	24	17	15	10	15
N.O.	0	0	0	0	0	0	0	0	0	0

* Subscale 16 was dropped from the test.

Appendix D1 Continued

Items		Ages									
		3	4	5	6	7	8	9	10	11	12
18.2	Pass	0	0	0	0	0	0	0	4	2	10
	Fail	4	13	17	16	19	24	20	16	13	15
	N.O.	0	0	0	0	0	0	0	0	0	0
18.3	Pass	0	0	0	0	0	0	0	3	1	7
	Fail	4	13	17	16	19	24	20	17	14	18
	N.O.	0	0	0	0	0	0	0	0	0	0
18.4	Pass	0	0	0	0	0	0	0	3	0	7
	Fail	4	13	17	16	19	24	20	17	15	18
	N.O.	0	0	0	0	0	0	0	0	0	0
18.5	Pass	0	0	0	0	0	0	0	3	0	8
	Fail	4	13	17	16	19	24	20	17	15	17
	N.O.	0	0	0	0	0	0	0	0	0	0
18.6	Pass	0	0	0	0	0	0	0	1	0	1
	Fail	4	13	17	16	19	24	20	19	15	23
	N.O.	0	0	0	0	0	0	0	0	0	1
18.7	Pass	0	0	0	0	0	0	0	1	0	1
	Fail	4	13	17	16	19	24	20	19	15	23
	N.O.	0	0	0	0	0	0	0	0	0	1
18.8	Pass	0	0	0	0	0	1	2	5	4	10
	Fail	4	13	17	16	19	23	18	15	11	15
	N.O.	0	0	0	0	0	0	0	0	0	0
19.1	Pass	1	3	8	13	18	23	18	18	14	25
	Fail	3	10	9	3	1	1	2	2	1	0
	N.O.	0	0	0	0	0	0	0	0	0	0
19.2	Pass	0	0	0	0	0	0	2	1	2	6
	Fail	4	13	17	16	19	24	18	19	13	19
	N.O.	0	0	0	0	0	0	0	0	0	0
19.3	Pass	0	0	0	0	0	2	4	1	4	7
	Fail	4	13	17	16	19	22	16	19	11	18
	N.O.	0	0	0	0	0	0	0	0	0	0
20.1	Pass	0	6	14	10	17	19	18	20	14	23
	Fail	4	7	3	6	2	5	2	0	1	2
	N.O.	0	0	0	0	0	0	0	0	0	0
20.2	Pass	0	5	11	8	13	20	19	16	14	24
	Fail	4	8	6	8	6	4	1	4	1	1
	N.O.	0	0	0	0	0	0	0	0	0	0
20.3	Pass	0	2	8	4	6	12	9	17	8	14
	Fail	4	11	9	12	13	12	11	3	7	11
	N.O.	0	0	0	0	0	0	0	0	0	0
20.4	Pass	0	2	9	5	8	10	7	14	6	15
	Fail	4	11	8	11	11	14	13	6	9	10
	N.O.	0	0	0	0	0	0	0	0	0	0
21.1	Pass	0	5	3	3	12	11	12	15	11	19
	Fail	3	2	7	3	4	7	4	3	3	5
	N.O.	1	6	7	10	3	6	4	2	1	1
21.2	Pass	1	5	8	4	12	13	12	11	10	15
	Fail	1	1	1	0	1	2	0	1	0	0
	N.O.	2	7	8	12	6	9	8	8	5	10
21.3	Pass	0	0	0	0	0	1	0	0	0	0
	Fail	2	6	9	4	13	14	12	12	10	15
	N.O.	2	7	8	12	6	9	8	8	5	10

Appendix Dl Continued

Items		3	4	5	6	7	8	9	10	11	12
		Ages									
22.1	Pass	0	0	0	1	1	3	7	9	5	12
	Fail	4	13	17	15	18	21	13	11	10	13
	N.O.	0	0	0	0	0	0	0	0	0	0
22.2	Pass	0	0	0	0	0	5	4	2	2	11
	Fail	4	13	17	16	19	19	16	18	13	14
	N.O.	0	0	0	0	0	0	0	0	0	0
22.3	Pass	0	0	0	0	1	3	6	7	3	9
	Fail	4	13	17	16	18	21	14	13	12	16
	N.O.	0	0	0	0	0	0	0	0	0	0
23.1	Pass	4	7	11	12	14	19	18	19	15	23
	Fail	0	0	0	0	1	1	0	0	0	0
	N.O.	0	6	6	4	4	4	2	1	0	2
23.2	Pass	1	2	6	7	10	20	18	19	14	22
	Fail	3	5	5	5	5	0	0	0	1	1
	N.O.	0	6	6	4	4	4	2	1	0	2
23.3	Pass	0	2	7	5	10	18	17	17	14	22
	Fail	4	5	4	7	5	2	1	2	1	1
	N.O.	0	6	6	4	4	4	2	1	0	2
23.4	Pass	1	3	6	6	12	16	16	17	12	22
	Fail	3	4	5	6	3	4	2	2	3	1
	N.O.	0	6	6	4	4	4	2	1	0	2
23.5	Pass	0	2	4	4	11	14	12	15	12	19
	Fail	4	5	7	8	4	6	6	4	3	4
	N.O.	0	6	6	4	4	4	2	1	0	2
24.1	Pass	0	3	7	10	13	22	20	18	15	23
	Fail	4	10	10	6	6	2	0	2	0	2
	N.O.	0	0	0	0	0	0	0	0	0	0
24.2	Pass	0	3	7	9	13	22	19	17	15	22
	Fail	4	10	10	7	6	2	1	3	0	3
	N.O.	0	0	0	0	0	0	0	0	0	0
24.3	Pass	0	4	6	8	10	19	13	15	11	18
	Fail	4	9	11	8	9	5	7	5	4	7
	N.O.	0	0	0	0	0	0	0	0	0	0
24.4	Pass	0	0	4	6	7	17	12	14	11	18
	Fail	4	13	13	10	12	7	8	6	4	7
	N.O.	0	0	0	0	0	0	0	0	0	0
25.1	Pass	4	13	16	15	19	24	20	19	15	24
	Fail	0	0	1	1	0	0	0	1	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
25.2	Pass	4	13	16	15	18	24	20	19	15	24
	Fail	0	0	1	1	1	0	0	1	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
25.3	Pass	2	11	14	13	18	24	19	18	15	24
	Fail	2	2	3	3	1	0	1	2	0	1
	N.O.	0	0	0	0	0	0	0	0	0	0
25.4	Pass	1	0	3	6	3	8	5	7	4	9
	Fail	3	13	14	10	16	16	15	13	11	16
	N.O.	0	0	0	0	0	0	0	0	0	0
26.1	Pass	3	11	16	16	19	24	20	20	15	25
	Fail	1	2	1	0	0	0	0	0	0	0
	N.O.	0	0	0	0	0	0	0	0	0	0

Appendix D1 Continued

Items		Ages									
		3	4	5	6	7	8	9	10	11	12
26.2	Pass	0	7	13	13	18	22	20	18	14	23
	Fail	4	6	4	2	0	0	0	1	1	2
	N.O.	0	0	0	1	1	2	0	1	0	0
26.3	Pass	0	2	8	8	12	19	18	18	12	19
	Fail	4	9	6	5	3	2	2	1	3	4
	N.O.	0	2	3	3	4	3	0	1	0	2
26.4	Pass	0	5	8	9	10	18	15	18	15	19
	Fail	4	8	9	7	9	6	5	2	0	6
	N.O.	0		0	0	0	0	0			0
27.1	Pass	4	11	15	14	16	21	19	19	13	24
	Fail	0	0	1	0	0	0	0	0	0	0
	N.O.	0	2	1	2	3	3	1	1	2	1
27.2	Pass	4	11	15	14	15	21	19	19	13	24
	Fail	0	0	1	0	1	0	0	0	0	0
	N.O.	0	2	1	2	3	3	1	1	2	1
27.3	Pass	0	7	9	11	14	18	18	17	13	22
	Fail	3	3	2	3	2	3	1	1	1	2
	N.O.	1	3	6	2	3	3	1	2	1	1
27.4	Pass	0	7	9	11	14	18	18	17	13	22
	Fail	3	3	2	3	2	3	1	1	1	2
	N.O.	1	3	6	2	3	3	1	2	1	1
	Number	4	13	17	16	19	24	20	20	15	25

APPENDIX D2

PERCENTAGE OF SUCCESS, BY AGE GROUPS, FOR EIGHTY-TWO SELECTED ITEMS (WHICH WERE PASSED BY 20-80 PER CENT OF CHILDREN ATTEMPTING ITEM IN ONE OR MORE AGE GROUPS)*

Items (listed in order of average per cent passed)	Reliability coefficient (ages 4-12)	Age Groups					Average percent passed
		3-4	5-6	7-8	9-10	11-12	
13.2	xx	77	91	98	100	98	93
3.3	xx	59	97	98	100	100	91
3.4	.60	59	94	100	100	100	91
11.1	xx	67	89	97	100	98	90
11.3	xx	59	94	98	100	100	90
12.2	.68	71	91	95	95	98	90
25.3	.85	77	82	98	93	98	90
17.4	.26	59	91	98	98	98	89
3.2	xx	59	82	95	100	100	87
17.2	-.05	43	96	97	100	95	86
12.3	.37	53	85	95	95	98	85
8.1	.23	41	91	91	95	100	84
3.1	.48	41	88	95	88	98	82
12.1	.64	35	88	98	93	98	82
26.2	xx	41	81	100	97	93	82
11.2	-.04	47	64	94	100	98	81
27.3	xx	54	80	86	92	92	81
27.4	.45	54	80	87	92	92	81
8.5	.32	35	79	88	95	98	79
11.5	.85	24	70	100	100	100	79
17.3	.15	27	73	93	100	100	79
2.3	.12	41	64	95	98	93	78
8.2	.55	24	79	91	95	98	77
3.5	.69	24	82	86	93	100	77
20.1	.15	35	73	84	95	93	76
9.3	.55	35	70	91	80	95	74
19.1	.92	24	64	95	90	98	74
23.2	.36	27	57	86	95	95	72
14.3	.30	29	67	84	88	80	70
15.1	.36	76	52	63	78	80	70
23.4	.49	37	52	80	89	90	70
7.6	xxx	29	61	88	90	79	69
10.2	.64	6	61	86	95	95	69
15.2	.94	29	58	74	93	93	69
20.2	.01	29	58	77	88	95	69
24.1	.76	18	52	81	95	95	68
10.3	.67	13	52	81	93	95	67
14.4	.58	35	52	88	78	83	67

Appendix D2 Continued

Items (listed in order of average per cent passed)	Reliability coefficient (ages 4-12)	Age Groups					Average percent passed
		3-4	5-6	7-8	9-10	11-12	
23.3	.60	18	52	80	90	95	67
14.1	.22	41	52	70	85	83	66
24.2	.49	18	49	81	90	93	66
26.3	.79	12	59	86	92	82	66
21.1	.51	50	38	68	79	79	63
26.4	.44	28	51	65	83	85	63
3.6	-.25	6	52	74	80	76	58
10.4	.66	6	30	65	90	93	57
23.5	.71	18	35	71	75	82	56
9.4	.32	29	64	63	63	58	55
24.3	.72	24	42	67	70	73	55
17.1	-.03	19	55	67	90	38	54
10.5	.72	6	33	58	78	83	52
4.5	.73	53	64	51	48	33	50
7.5	.43	6	36	56	73	78	50
12.4	.33	6	37	67	73	67	50
4.4	.30	35	52	49	55	53	49
7.3	.16	24	36	53	60	70	49
8.3	.43	0	27	56	73	83	48
24.4	.67	0	30	58	65	73	45
7.4	.36	12	33	58	55	60	44
10.7	xxx	6	12	49	75	80	44
7.7	.63	0	21	39	75	77	42
20.3	.16	12	36	42	65	55	42
8.4	.30	6	21	48	58	65	40
20.4	.17	12	42	42	53	53	40
13.4	.73	6	9	37	68	73	39
14.5	.84	0	27	30	65	73	39
2.4	.24	0	33	38	60	45	35
4.6	.44	29	36	40	28	23	31
15.3	.32	6	18	23	48	59	31
25.4	.58	6	27	26	30	33	25
22.1	.45	0	3	9	40	43	19
17.5	.58	0	12	12	35	28	17
22.3	.57	0	0	9	33	30	14
22.2	.27	0	0	12	15	33	12
18.1	.46	0	0	0	20	35	11
18.8	.51	0	0	2	18	35	11
19.3	.16	0	0	5	13	28	11

Appendix D2 Continued

Items (listed in order of average per cent passed)	Reliability coefficient (ages 4-12)	Age Groups					Average percent passed
		3-4	5-6	7-8	9-10	11-12	
2.2	.02	0	6	5	8	20	8
18.2	.40	0	0	0	10	30	8
18.3	.01	0	0	0	8	20	6
18.5	.05	0	0	0	8	20	6
19.2	-.08	0	0	0	8	20	6

* Percentages underlined are within the 20-80 per cent age range

xx Coefficient could not be computed because the _bc_ term in the formula for the phi coefficient was zero; i.e., either there were no instances of both examiners failing a pupil or there were no instances of both examiners passing a pupil on the item.
NOTE: The following items which satisfied the "difficulty criterion" were omitted from this table because performance was observable in less than two-thirds (2/3) of the cases:

Items: 10.6, 11.4, 15.4, 17.6, 21.2, and 21.3.

xxx **Performance on this item was not observable in one third or more of the clases in the reliability sample.**

APPENDIX D3

RELIABILITY COEFFICIENTS BY AGE GROUPS FOR THE EIGHTY-TWO SELECTED ITEMS

(Items passed by 20-80 per cent of the children at one or more age levels)

		Phi Coefficients			
		Ages 4-6	Ages 7-9	Ages 10-12	Total Group
ITEM	N:	(N-14)	(N-15)	(N-16)	(N-45)
2.2		xx	.14	-.33	.02
2.3		-.26	xx	.33	.12
2.4		-.25	.02	.36	.24
3.1		.53	xx	xx	.48
3.2		xx	xx	xx	xx
3.3		xx	xx	xx	xx
3.4		.43	xx	xx	.60
3.5		.65	xx	xx	.69
3.6		.14	xx	xx	-.25
4.4		.25	.27	.37	.30
4.5		xx	.73	.78	.73
4.6		.71	.71	-.05	.44
7.3		-.09	xx	xx	.16
7.4		.27	.53	xx	.36
7.5		.16	.71	.33	.43
7.6		-.08	xxx	xxx	xxx
7.7		.57	.71	xx	.63
8.1		.68	xx	xx	.23
8.2		.41	.42	1.00	.55
8.3		.39	.21	.43	.43
8.4		.16	.45	-.10	.30
8.5		.41	.29	xx	.32
9.3		.52	xx	.32	.55
9.4		.14	.13	xx	.32
10.2		.29	1.00	xx	.64

Appendix D3 Continued

	Phi Coefficients			
ITEM	Ages 4-6 (N-14)	Ages 7-9 (N-15)	Ages 10-12 (N-16)	Total Group (N-45)
10.3	.65	xx	xx	.67
10.4	.40	.78	xx	.66
10.5	.38	1.00	xx	.72
10.7	xxx	xxx	xxx	xxx
11.1	xx	xx	xx	xx
11.2	xx	xx	xx	-.04
11.3	xx	xx	xx	xx
11.5	.82	xx	xx	.85
12.1	1.00	.42	xx	.64
12.2	1.00	xx	xx	.68
12.3	.68	xx	xx	.37
12.4	.19	.29	.26	.33
13.2	xx	xx	xx	xx
13.4	1.00	-.20	.83	.73
14.1	.62	-.03	.09	.22
14.3	.41	xx	xx	.30
14.4	.71	.29	xx	.58
14.5	.78	.64	.32	.84
15.1	-.17	.42	1.00	.36
15.2	.73	xx	xx	.94
15.3	.30	.21	.24	.32
17.1	-.18	.08	xx	-.03
17.2	xx	xx	xx	-.05
17.3	.06	xx	xx	.15
17.4	xx	1.00	xx	.26
17.5	1.00	.65	.31	.58
18.1	xx	-.10	.63	.46
18.2	xx	xx	.52	.40
18.3	xx	xx	-.15	.01
18.5	xx	xx	.54	.05
18.8	xx	.71	.63	.51
19.1	.87	1.00	xx	.92
19.2	xx	xx	xx	-.08

Appendix D3 Continued

ITEM	Phi Coefficients Ages 4-6 (N-14)	Ages 7-9 (N-15)	Ages 10-12 (N-16)	Total Group (N-45)
19.3	xx	.43	xx	.16
20.1	.12	.29	xx	.15
20.2	.19	xx	xx	.01
20.3	.15	.61	xx	.16
20.4	-.07	.43	.15	.17
21.1	.69	.51	xx	.51
22.1	.68	.21	.22	.45
22.2	xx	.21	.29	.27
22.3	xx	.43	.68	.57
23.2	.64	xx	xx	.36
23.3	.64	1.00	xx	.60
23.4	xxx	xxx	xx	.49
23.5	xxx	xxx	.65	.71
24.1	.71	1.00	xx	.76
24.2	.87	.68	xx	.49
24.3	1.00	.45	.62	.72
24.4	1.00	.42	.22	.67
25.3	.78	1.00	xx	.85
25.4	.52	.70	.45	.58
26.2	xx	xx	xx	xx
26.3	.60	1.00	1.00	.79
26.4	.42	.16	xx	.44
27.3	xx	xx	xx	xx
27.4	xx	xx	.63	.45

xx Coefficient could not be computed because the "bc" term in the formula for the phi coefficient was zero; i.e., either there were no instances of both examiners failing a pupil or there were no instances of both examiners passing a pupil on the item.

xxx Performance on this item was not observable in one-third (1/3) or more of the cases.

APPENDIX E

INSTRUMENTS RESULTING FROM THE PROJECT

PART I: ORIENTATION AND MOBILITY SCALE FOR YOUNG BLIND CHILDREN

Short Form - Experimental Edition

The Scale is comprised of a number of skills which have been demonstrated to have satisfactory reliability and difficulty for blind children, ages five through twelve. The subscales are arranged in an order which is convenient for administration. However, the order may be changed if the examiner desires. Tentative norms are supplied.*

Procedures for Scoring

PLUS + Behavior or response meets standard described for scoring.

PLUS PARENTHESIS (+) Credit assigned by examiner. Skill was demonstrated as part of previous item.

MINUS - Behavior or response does not meet the standard described for scoring.

MINUS PARENTHESIS (-) Failure assigned by examiner. Subject demonstrated on previous item that he could not perform the required task.

NO OPPORTUNITY N.O. No opportunity to observe. Subject cannot be scored on items due to any one of the following conditions:

Physical setting: Setting did not provide an adequate opportunity for judging the behavior.

Weather conditions: Weather conditions (wind, rain, snow) interfere with auditory cues and/or travel conditions and prevent an adequate testing situation.

Personal factors: Because of emotional disturbance, fatigue, or some other reason, the child appears to be unable to react or to respond with alertness.

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* See E-22.

DIRECTIONS, TURNS

1. RESPONDS CORRECTLY TO A COMMAND TO TURN LEFT.

*(8.2) PROCEDURE: Take child to open doorway. Say, "Let's look at this doorway." Allow him to explore the opening. Examiner stands approximately three feet from opening. Say, "Now come back here where I am. I want you to go out of the door and turn left. Keep walking until I tell you when to stop."

SCORE: Makes left turn correctly. Walks several steps.

2. CORRECTLY DESCRIBES A FAMILIAR ROUTE IN TERMS OF RIGHT AND LEFT TURNS.

(8.3) PROCEDURE: Select a short route known to the child which requires a right and a left turn. Say, "Tell me how you would go from here to - - - . Tell me which turns you must make."

SCORE. Describes route correctly using terms "right" and "left." If the child responds in terms of a landmark, say, "Tell me in another way."

3. POINTS OUT CARDINAL DIRECTIONS IN A FAMILIAR SETTING.

(22.1) PROCEDURE: Say, "You are being turned to face the north." Face the child to north. "Now face east - Now west - Now south."

SCORE: Child faces correct directions each time. If child becomes confused, stop and repeat the entire procedure once.

4. TRAVELS A ROUTE WITH ONE TURN DESCRIBED IN TERMS OF CARDINAL DIRECTIONS.

(22.3) PROCEDURE: Use a short hallway in school building or the sidewalk in front of the building. Face the child to the south. Say, "You are now facing south. Walk until I say, 'turn' - then turn to the east."

SCORE: Child makes correct directional turn.

* The number in parenthesis indicates the original item number as it appeared in the Experimental Edition and as it appears throughout the Report.

MOVEMENT IN SPACE

5. POINTS TOES IN DIRECTION OF TRAVEL WHILE WALKING.

(4.5) PROCEDURES: Say, "There is nothing in your way. Show me how you walk across the room without holding on to anything." Child should take about twenty steps.

SCORE: Child's feet point in direction of travel with less than an approximate 20 degree deviation. Child may use hand and forearm technique. He may not use a guide.

6. WALKS WITH RELAXED GAIT

(4.6) PROCEDURE: Repeat procedure 1.

SCORE: Steps are in proportion to size of child, neither too long nor too short. Steps are even and rhythmic. Arms swing in a natural manner.

7. WALKS UP STEPS ALTERNATING FORWARD FOOT, ONE FOOT PER TREAD.

(23.4) PROCEDURE: Say, "Walk up these steps."

SCORE: Child walks up steps alternating forward foot, one foot per tread.

8. WALKS DOWN STEPS, ALTERNATING FORWARD FOOT, ONE FOOT PER TREAD.

(23.5) PROCEDURE: Say, "Now, walk down."

SCORE: Child walks down steps alternating forward foot, one foot per tread.

9. HOPS ON ONE FOOT.

(24.1) PROCEDURE: Say, "Show me how you can hop. Hop until I tell you to stop."

SCORE: Child hops at least three times on one foot.

10. HOPS, ALTERNATING FEET.

(24.2) PROCEDURE: Say, "Now hop first on one foot and then on the other one. I'll tell you when to stop."

SCORE: Child hops first on one foot, then on the other. Alternates three times.

11. **GALLOPS.**

(24.3) **PROCEDURE:** Have child walk about an unobstructed area about thirty feet long. When he does this, say, "There is nothing in the way, is there? Now show me how you can gallop."

SCORE: Child clearly demonstrates galloping pattern.

12. **SKIPS.**

(24.4) **PROCEDURES:** Say, "Now show me how you can skip."

SCORE: Child clearly demonstrates skipping pattern.

13. **RUNS FREELY BY HIMSELF.**

(25.4) **PROCEDURE:** Have child walk about an unobstructed area about thirty feet long. When he has done this, say, "There is nothing in the way, is there? Show me how fast you can run." Tell the child to stop when he has demonstrated apparent top speed.

SCORE: Runs without apparent restraint - arms moving freely, body thrust forward. If child runs freely, but with arms in a protective position, score minus.

14. **JUMPS OFF LOW WALL OR BENCH.**

MATERIALS: Use a low wall or bench approximately eighteen inches high.

(26.3) **PROCEDURE:** Say, "Here is a (low wall) (bench) - - look at it." Allow child to explore bench or low wall tactually and climb upon it. "Now, show me how you can jump off of it."

SCORE: Jumps without falling.

15. **JUMPS, COORDINATING OTHER BODY MOVEMENTS.**

(26.4) **PROCEDURE:** Say, "Jump and clap your hands over your head at the same time." (Or, "Do the jumping jack.") "Do it until I tell you to stop." Demonstrate if necessary.

SCORE: Three jumps, coordinated, hands clapping overhead when feet are off ground.

SELF HELP

16. DEMONSTRATES WORKING PARTS OF DOORS.

(7.5) PROCEDURE: Say, "Where are the hinges? Tell me how they work."

SCORE: Child must describe their function - i.e., "They allow the door to swing. It makes the door open."

17. USES KEY TO LOCK AND UNLOCK DOORS.

MATERIALS: Key to selected door.

(7.7) PROCEDURE: Say, "Here is the key to this door. Show me how to lock this door. Now, unlock it."

SCORE: Finds keyhole. Locks and unlocks door. Child need not remove the key.

18. PUTS ON SWEATER UNASSISTED.

(10.2) PROCEDURE: Say, "Pick up the sweater from the chair and put it on."

SCORE: Child puts sweater on correctly without assistance.

19. BUTTONS SWEATER.

(10.3) PROCEDURE: Have child keep sweater on. Say, "Button it up."

SCORE: Starts at top or bottom and buttons three out of five buttons in corresponding holes.

20. PUTS ON SWEATER UNASSISTED WHEN ONE SLEEVE HAS BEEN TURNED INSIDE OUT.

(10.4) PROCEDURE: Turn one sleeve inside out. Place sweater on table. Say, "Now, this will be harder. See if you can put this sweater on."

SCORE: Child turns sleeve right side out. Puts sweater on correctly without assistance.

21. PUTS ON BELT AND FASTENS BUCKLE CORRECTLY.

MATERIAL: Belt

(10.5) PROCEDURE: Hand the child the belt. Say, "Put this belt on and buckle it up."

SCORE: Fastens buckle so that it does not slip.

22. DIALS TELEPHONE NUMBERS SUCCESSFULLY.

(13.4) PROCEDURE: Say, "Now I want you to dial a number. Please dial 1 - 9 - 6 - 3." Repeat the numbers if necessary.

SCORE: Dials successfully using any method, such as touch method or counting method.

23. IDENTIFIES SIMPLE TOOLS.

(14.4) PROCEDURE: Hand child, in turn, a pliers, a braille ruler, a screw driver, and a small hand saw. Say for each, "What is this and how do we use it?"

SCORE: Child correctly names or demonstrates (pantomimes) use of three out of four of the tools.

24. USES HELPING HAND EFFICIENTLY.

(14.5) PROCEDURE: Give child a paper with a three inch heart form firmly clipped to it. Say, "Use this marking wheel and draw around this pattern."

SCORE: Child draws with dominant hand and uses other hand as a guide to follow line of pattern.

APPENDIX E

PART II: INSTRUCTIONAL TEST IN ORIENTATION AND MOBILITY FOR YOUNG BLIND CHILDREN

Section A. Pre-cane orientation and mobility skills.

DIRECTIONS: The subscales may be administered in any order convenient to the examiner. It is suggested that the examiner check (✓) all items the child passes. No norms can be provided at this time. The examiner must be familiar with the terminology and techniques referred to in the test.

USING FAMILIARIZATION TECHNIQUES

1. EXPLORES AREA WITH SIGHTED GUIDE.

   PROCEDURE: Choose a relatively unfamiliar furnished room (of average classroom or living room size). Child and examiner take a position in the doorway. Enumerate the objects in the room to the child. Say, "Let's start here at the door and walk around and look at this room. Later I'm going to ask you about the things in the room." Walk about the room with the child. Encourage child to explore objects tactually in passing. Say, "What does this feel like?" ("What is this object?") Correct any incorrect ideas. Encourage questions by the child.

   SCORE: Child names at least five objects and/or asks relevant questions about the room and its contents.

2. TRAILS THE PERIMETER OF THE ROOM BY HIMSELF.

   PROCEDURE: Use the same room explored in previous item. Say, "Show me what you would do to find out about this room by yourself."

   SCORE: Child goes around the perimeter of the room using acceptable trailing technique. Intermittent use of the correct technique constitutes success even though he interrupts to investigate objects.

3. CHECKS OR NOTES OBJECTS WITHIN REACH FROM A POINT ON THE PERIMETER OF THE ROOM.

   PROCEDURE: Take the child to the perimeter of the room where there are objects (desk, chair, table) within reaching distance. Say, "Tell me what is around you."

SCORE: Child locates two objects and identifies them.

4. DEMONSTRATES AWARENESS OF SPATIAL PATTERN OF OBJECTS IN ROOM.

PROCEDURE: Use same room explored in previous item. Select a major item of furniture. Say, "Find the - - (teacher's desk, sofa, table, bookself). Without looking around anymore, tell me what is beside it? Now what is in front of it? Behind it?" Require child to remain beside object selected while responding.

SCORE: Child locates selected object and names without touching appropriate objects in two of the three above positions.

5. DEMONSTRATES TWO METHODS OF ESTIMATING SIZE OF THE ROOM.

PROCEDURE: Use same room explored in previous item. Say, "Can you show me one way you can get an idea about the size of this room? Can you tell me another way?"

SCORE: Demonstrates and describes. Walks length and width of test area. Describes the variation in echo or sound as a cue to size of the room. Must give both methods.

USING DIRECTION TAKING

6. USES SOUND SOURCES TO ESTABLISH A COURSE OF STRAIGHT LINE TRAVEL TO AN OBJECT.

PROCEDURE: Select a room relatively familiar to the child. Take a position across the room from the child where he can move toward you in a straight line. Say, "I am going to clap my hands several times. Walk over to me in a straight line." Continue to clap hands at about the rate of once per second until child arrives.

SCORE: Child must arrive within approximately one foot either side of exact sound source.

7. DEMONSTRATES SQUARING OFF TECHNIQUE.

Testing room for Items 7, 8, 9, 10 should be familiar to the child and provide space for him to move at least five paces to an object from the door.

PROCEDURE: Say, "Go to the door of this room and square off."

SCORE: Aligns body squarely with the door. Do not proceed to Items 8, 9, and 10 if this item is failed.

8. DETERMINES A DIRECTION OF TRAVEL IN RELATION TO A FIXED OBJECT.

PROCEDURE: Have child remain at door with which he has squared off. Say, "Name an object in the room which is not directly in front of you, but to which you could go easily." If object is directly in front of child or less than five paces away from him, ask child to name another object which is farther away. Examiner may suggest a goal. Make sure goal (object) selected will permit squaring off. See Item 10. Say, "Turn toward the - - - - (object)."

SCORE: Correctly aligns body at required angle to achieve direct line of travel to selected objective.

9. MOVES DIRECTLY TOWARD SELECTED GOAL UPON REQUEST.

PROCEDURE: Say, "Now go directly toward the - - - - (object) until you can touch it."

SCORE: Reaches object selected and is able to make tactual contact with it.

10. RETURNS DIRECTLY TO STARTING POINT UPON REQUEST.

PROCEDURE: Go to child. Say, "Now go straight back to the door."

SCORE: Child turns, squares off with object, turns toward door, and returns directly within one foot of door.

USING SEARCH PATTERNS

11. USES AUDITORY CUES TO PIN-POINT LOCATION OF DROPPED OBJECT.

MATERIALS: Four one-inch steel washers.

PROCEDURE: Use room with hard surface floor. Stand beside child. Position of examiner remains fixed to avoid giving additional cues. Say, "Here is a little steel circle." Allow child to examine washer. Say, "I am going to drop one of these to the floor. Listen and point to the spot where it stops." Hold washer at waist height and drop at arms length distance in front of the child. Drop between examiner and subject to avoid masking sound. Drop to either side and behind child, repeating instructions each time. Do not retrieve washers until all have been dropped.

SCORE: Child points accurately three out of four times.

12. STARTS AT POINT AND SWEEPS A WIDENING CIRCLE WITH ARM AND HAND.

MATERIALS: A steel washer.

PROCEDURE: Follow same procedure as in Item 11, but drop washer out of reach (approximately four feet). Say, "Now, show me how you can find the circle."

SCORE: Child must demonstrate a correct circular search pattern. Score either Item 12 or 13, depending on pattern used.

13. USES A SQUARE PATTERN - MAKING HORIZONTAL OR OVERLAPPING SWEEPS.

MATERIALS: A steel washer.

PROCEDURE: Repeat procedure outlined in Item 12. Say, "Can you show me another way of looking for the circle?"

SCORE: Child must demonstrate a correct square search pattern. Score Item 12 or 13, depending on pattern used.

14. USES PROTECTIVE STOOPING TECHNIQUE IN STOOPING TOWARD OBJECT.

MATERIALS: A steel washer.

PROCEDURE: Use same procedure as outlined in Item 12. Drop the washer so that it goes under the table. Protect the child from bumping his head if it is obvious that he is not employing the protective technique. Say, "Now it went under the table. See if you can find it."

SCORE: Child must demonstrate protective stooping technique. Retrieving washer not necessary.

USING SIGHTED GUIDE

15. **CORRECTLY GRASPS SIGHTED GUIDE'S ARM.**

PROCEDURE: Select in advance a route which will afford the following features: an uncrowded corridor, a crowded area, at least three steps up and down, a closed door opening on child's side, a closed door opening on guide's side, and a definite turn in either direction. These situations are adequate for observing the child's performance as a basis for scoring Items 16, 17, 18, 19, 20. Say, "Let's go for a walk. Take my arm and show me how you walk with a sighted guide."

SCORE: Thumb just above elbow, fingers on body side. If child succeeds in Item 15, examiner may score Items 16-20. If child fails, omit remaining items.

16. **WALKS CORRECTLY WITH GUIDE UNDER NORMAL CONDITIONS.**

SCORE: Child walks to side and one-half pace behind guide.

17. **USES POSITIONAL CUES AND MOVEMENT OF SIGHTED GUIDE IN CROWDED AREAS.**

PROCEDURE: Approach crowded area (a narrow passage may be substituted if crowd is not available). Move the elbow of the arm the child is grasping toward the center of your back. Do not warn child in advance.

SCORE: Child extends arm and moves directly behind guide on signal.

18. **USES MOVEMENT OF SIGHTED GUIDE TO ANTICIPATE ASCENDING STEPS.**

PROCEDURE: Approach ascending steps; do not warn child. Step up. If a series of steps is not available, use a curb two times.

SCORE: Child, walking a half pace behind guide, feels guide's upward movement and also steps up.

19. **USES MOVEMENT OF SIGHTED GUIDE TO ANTICIPATE DESCENDING STEPS.**

PROCEDURE: Approach descending steps; do not warn child.

Step down. If a series of steps is not available, use a curb two times.

SCORE: Child feels guide's movement and steps down.

20. ASSISTS IN OPENING AND CLOSING DOORS WHICH OPEN ON HIS SIDE.

PROCEDURE: Open a closed door which swings to child's side.

SCORE: Child drops one pace behind when guide opens a door and holds it open for both to pass through. If it is not a self-closing door, the child closes the door when both have passed through.

21. ASSISTS IN OPENING AND CLOSING DOOR WHICH OPENS ON GUIDE'S SIDE.

PROCEDURE: Open a door which opens on guide's side. If none is available, change sides with child.

SCORE: Child momentarily grasps guide's other arm with his opposite hand and extends his arm so that he may hold the door open with the other hand. If the door is not self-closing, the child closes it.

22. MAINTAINS OWN ALERTNESS AND ORIENTATION.

PROCEDURE: As you walk, make a turn. Say, "Which way did we turn?"

SCORE: Child responds by either naming cardinal direction, right or left, or indicates he is moving toward a particular place or landmark.

USING TRAILING TECHNIQUES

23. USES APPROPRIATE HAND TO TRAIL.

PROCEDURE: Select route along a corridor where there are at least two doors, one of which should be open, and an object which is waist high, such as a drinking fountain or a trash barrel. Say, "Trail along this wall until I tell you to turn around and come back." When child has passed the last object, say, "Now trail back on the same side of the hall."

SCORE: Uses right hand when wall or other object is on his right; uses left hand when wall or objects are on his left. Child may employ non-trailing hand in a protective manner as long as he does not touch the wall with it. If child succeeds, examiner may score items 24 and 25. If child fails, omit remaining items.

24. USES HAND AND FINGERS IN APPROVED MANNER.

PROCEDURE: Examiner may repeat instructions if necessary.

SCORE: Holds hand forward of the hip, back of fingers contacting wall or other object. Fingers point down and slightly to the rear.

25. TRAILS EFFICIENTLY, DISCOVERING AND AVOIDING HAZARDS.

PROCEDURE: Examiner may repeat instructions if necessary.

SCORE: Avoids objects by going around them without bumping.

APPENDIX E

SECTION B - GENERAL ORIENTATION AND MOBILITY TASKS

Standardized Procedures for Administration and Scoring

Directions: The scales may be administered in any order convenient to the examiner. The materials needed for certain items have been described so that the examiner may assemble his own kit. The suggested procedure for scoring each item is given below.

Procedures for Scoring

PLUS: +

Behavior or response meets standard described for scoring.

PLUS PARENTHESIS: (+)

Credit assigned by examiner. Skill was demonstrated as part of previous item.

MINUS: -

Behavior or response does not meet the standard described for scoring.

MINUS PARENTHESIS: (-)

Failure assigned by examiner. Subject demonstrated on previous item that he could not perform the required task.

NO OPPORTUNITY: N O

No opportunity to observe. Subject cannot be scored on items due to any one of the following conditions:

Physical Setting:	Setting did not provide an adequate opportunity for judging the behavior.
Weather Conditions:	Weather conditions (wind, rain, snow) interfere with auditory cues and/or travel conditions and prevent an adequate testing situation.
Personal Factors:	Because of emotional disturbance, fatigue, or some other reason, the child appears to be unable to react or to respond with alertness.

1. USING TACTUAL CUES

   1.1 USES TOUCH TO DISTINGUISH GROSS DIFFERENCES IN TEXTURE.

MATERIALS: Two 3/8" wood dowels 2½" long, one 3/8" spiral glue pin, 2½" long.

PROCEDURE: Place the two smooth identical objects and one rough object before child. Say, "Here are three pieces of wood all the same size. Give me the one that is different from the others."

SCORE: Child must hand examiner the grooved piece.

1.2 INVESTIGATES THROUGH TOUCH THE AREA WITHIN ARM'S REACH.

MATERIALS: Empty spool, bottle cap, round typewriter ribbon can.

PROCEDURE: Seat child at a table or on the floor. Place objects within arm's reach. Say, "I am placing some objects on the (floor) (tables) around you. Look at each one and tell me what it is like."

SCORE: Child describes or names each object.

1.3 USES FEET TO DISTINGUISH SURFACE DIFFERENCES.

MATERIALS: Employ two contrasting surfaces such as uncarpeted to carpeted; wood to cement; cement to soil.

PROCEDURE: Say, "Walk along here and tell me when your feet feel something different."

SCORE: Reports change as he passes from one surface to the other.

1.4 MAKES DISCRIMINATIONS BETWEEN OBJECTS OF SIMILAR SURFACES OR TEXTURES.

MATERIAL: A wall with three distinct identifiable surfaces.

PROCEDURE: Have child walk past an area with such things as: a plastered wall; a closed door; a closed window; papered wall; bulletin board. Say, "Walk along this wall. Feel it. Tell me when you find something different."

SCORE: Reports accurately when he comes to a different surface or texture on the wall. Naming of textures is not necessary.

1.5 MAKES DISCRIMINATIONS BETWEEN CLOTH OF SIMILAR TEXTURES.

MATERIALS: Three pieces of 2"x3½" cloth, (one satin, 2 cotton) mounted at top edge to one piece of cardboard 4"x8".

PROCEDURE: Hand the child the mounted samples of cloth. Say, "Here are three pieces of cloth of the same size. Find the one that is different."

SCORE: Indicates the piece of satin.

1.6 MAKES FINE DISCRIMINATIONS BETWEEN OBJECTS OF SIMILAR TEXTURES.

MATERIALS: Two pieces of braille paper, one piece of newsprint, all 2"x3½" - mounted to one piece of 4"x8" cardboard.

PROCEDURE: Hand the child the mounted samples of paper. Say, "There are three pieces of paper pasted on this cardboard. Show me the one that is different."

SCORE: Indicates piece of newsprint.

2. USING RIGHT AND LEFT

2.1 DISTINGUISHES LEFT AND RIGHT ON OWN BODY.

PROCEDURE: Say, "Show me your right hand. Show me your left foot. Touch your left ear. Touch your right elbow (shoulder)." The procedure may be repeated once if it seemed that an error was made due to momentary confusion.

SCORE: Shows the correct extremities.

2.2 RESPONDS CORRECTLY TO A COMMAND TO TURN LEFT.

PROCEDURE: Take child to open doorway. Say, "Let's look at this doorway." Allow him to explore the opening. Examiner stands approximately 3' from opening. Say, "Now come back here where I am. I want you to go out of the door and turn left. Keep walking until I tell you when to stop."

SCORE: Makes left turn correctly. Walks several steps.

2.3 CORRECTLY DESCRIBES A FAMILIAR ROUTE IN TERMS OF RIGHT AND LEFT TURNS.

PROCEDURE: Select a short route known to the child which requires a right and a left turn. Say, "Tell me how you would go from here to ---. Tell me which turns you must make."

SCORE: Describes route correctly using terms "right" and "left." If child responds in terms of a landmark, say, "Tell me in another way."

2.4 DISTINGUISHES LEFT AND RIGHT ON BODY OF ANOTHER PERSON.

If the child failed Item 2.1, do not administer this item.

PROCEDURE: Have child face examiner. Say, "Take my left hand." Follow with, "Touch my right shoe."

SCORE: Touches correct extremities.

2.5 DISTINGUISHES RIGHT AND LEFT IN THE ENVIRONMENT.

PROCEDURE: Have the child stand so that a door is to his right side. Say, "On which side of you is the door?" If child makes no response, or fails to use terms "right" or "left", say, "Is the door to your right or left?" Say, "Turn around and face the opposite direction." After child turns, say, "On which side of you is the door?"

SCORE: Responds correctly to each question.

3. IDENTIFYING ESSENTIAL PARTS OF THE BODY

3.1 TOUCHES MOUTH UPON REQUEST.

PROCEDURE: Ask child to touch his mouth. Say, "Touch your mouth."

SCORE: Touches mouth.

3.2 TOUCHES EXTREMITIES UPON REQUEST.

PROCEDURE: Ask child to show you his hands, then fingers, feet, then toes. Say, "Show me your---- (hands, fingers, etc.)."

SCORE: Shows correctly the requested parts of the body.

3.3 TOUCHES DIFFERENT PARTS OF BODY UPON REQUEST.

PROCEDURE: Ask child to show you his waist, shoulder, knees and arm. Say, "Show me your ---- (waist, shoulders, etc.)."

SCORE: Shows correctly the requested parts of the body.

3.4 IDENTIFIES BY NAMING ESSENTIAL PARTS OF BODY.

PROCEDURE: The examiner touches different parts of child's body and asks child to name them. Testing includes head, back, elbow, legs, neck, chest. Say, "What is this?" while touching part of body.

SCORE: Child names selected body parts correctly.

4. UNDERSTANDING TURNS

4.1 TURNS TO FACE OPPOSITE DIRECTION.

Say, "Turn around with your back to me."

SCORE: Turns approximately 180 degrees.

4.2 MAKES QUARTER TURN.

PROCEDURE: Now say, "Turn so that your side is toward me."

SCORE: Turns approximately 90 degrees.

4.3 MAKES COMPLETE TURN IN PLACE.

PROCEDURE: Have child stand facing examiner. Say, "Turn in a circle until you face me again."

SCORE: Turns approximately 360 degrees.

4.4 TURNS TO ESTABLISH A DIAGONAL LINE OF TRAVEL.

PROCEDURE: Position the child in the center of one wall of the room. Say, "You are standing with your back to the wall and you are facing the wall on the other side of the room. You are just as far from one corner of the wall on the other side of the room as you are from the other. Turn and walk toward either corner on the other side of the room."

SCORE: Successfully turns and moves toward one of the opposite corners.

4.5 TURNS APPROXIMATE ANGLES REQUESTED WHEN DIRECTIONS ARE STATED IN DEGREES.

PROCEDURE: Say, "Turn 360 degrees; 180 degrees; 90 degrees; 45 degrees."

SCORE: Approximates angles of each turn.

5. USING THE TELEPHONE

5.1 USES AUDITORY CUES TO RECOGNIZE THE TELEPHONE.

PROCEDURE: Test where a telephone bell can be heard. If needed take child to school office; arrange for a call when possible.

SCORE: Child correctly recognizes the telephone.

5.2 ANSWERS THE TELEPHONE.

PROCEDURE: Take child to telephone. Say, "Pretend the telephone is ringing. Show me how you would answer it."

SCORE: Picks up telephone placing earpiece to ear; mouthpiece to mouth. Returns receiver to cradle.

5.3 PLACES CALLS INDEPENDENTLY BY USING THE OPERATOR.

PROCEDURE: Have child choose a person he wishes to call. Say, "Show me how you can make a telephone call without dialing the numbers yourself."

SCORE: Child dials Operator. Reports he is blind. Requests Operator to place call to the person he names.

5.4 DIALS NUMBERS SUCCESSFULLY.

PROCEDURE: Say, "Now I want you to dial a number. Please dial 1 - 9 - 6 - 3." Repeat the numbers if necessary.

SCORE: Dials successfully using any method, such as touch method or counting method.

6. AUDITORY CUES - IDENTIFIES SOUNDS

6.1 IDENTIFIES VOICES OF PEOPLE WELL-KNOWN TO HIM.

PROCEDURE: Say, "Three people will talk to you. Tell me the name of each one when he talks." Have each of the three speak in turn.

SCORE: Accurately identifies the three children.

6.2 IDENTIFIES COMMON SOUNDS PRESENT IN THE ENVIRONMENT.

MATERIALS: One iece of ditto paper, playground whistle, bell.

PROCEDURE: Take a position across the room from the child. Say, "I am going to make some sounds. Tell me what each one is." Clap hands, footsteps, bell, opening door, playground whistle, crumple paper.

SCORE: Accurately identifies 5 out of 6 sounds.

6.3 IDENTIFIES OBJECTS AS SOUND SOURCES DURING TRAVEL.

PROCEDURE: Walk with child along route which will afford more than three sounds. Say, "Tell me each sound you hear as we walk along."

SCORE: Correctly identifies three different sound sources as he walks. (e.g., car passing, footsteps, voices, etc.)

7. REVERSING ROUTES

7.1 TRAVELS STRAIGHT LINE ROUTE AND REVERSES IT.

PROCEDURE: Take child across the room from a door. Have him stand by a chair facing the door. Say, "Walk to the door and then turn around and walk back to the chair." Avoid giving child an auditory cue by not speaking to him after he has started.

SCORE: Walks straight to any part of the door; turns around and returns to starting point. Makes contact with chair.

7.2 TRAVELS ROUTE WITH ONE TURN AND REVERSES IT.

PROCEDURE: Have the child stand by the chair facing door. Say, "Go through the door; turn either way; walk until I tell you to stop. Remember how you go so that you can come back the same way." Follow the child. When he has walked ten paces, say, "Now, return to the chair the same way you came."

SCORE: Goes out the door; turns; walks approximately ten paces; returns to chair by same route reversing direction of turn and order of landmarks he may have used.

7.3 TRAVELS ROUTE INVOLVING A COMBINATION OF ONE LEFT AND ONE RIGHT TURN.

PROCEDURE: Have child stand by the chair, facing the door. Agree upon an object a few paces to the left of the door, such as drinking fountain, another door, etc., which does not give a directional cue. Say, "Go through the door and make a left turn. Walk to the ---- (name object) and make a right turn. Keep walking until I tell you to stop." As long as one left and one right turn are required, the order is unimportant. Walk about ten paces behind the child, but do not help him physically or verbally. When child has completed route, go to him.

SCORE: Child follows prescribed route without help.

7.4 REVERSES ABOVE ROUTE.

PROCEDURE: Stand beside child where he finished route described in 3. Say, "Go back to the chair exactly the way you came." If child approaches task carelessly, repeat command. Follow child, but give no help.

SCORE: Child reverses turns and landmarks he used and returns to chair in the examining room.

8. ENTERING AND LEAVING AN AUTOMOBILE

8.1 DISCOVERS FOR HIMSELF WHICH DIRECTION CAR IS FACING.

PROCEDURE: Take child to passenger car. Car must not be parked in a spot which reveals the direction, i.e., a stall in front of the building, on a one way street. Stop about half-way between the front and the rear of the car an arm's length away from it. Say, "Here is a car. Find the front of the car. How can you tell?"

SCORE: Correctly identifies the front of the car in first response, using any safe method.

8.2 ENTERS AND LEAVES CAR INDEPENDENTLY, USING ANY METHOD.

PROCEDURE: Take child to right front door. Say, "Here is the right front door. Let's see you get into the car and sit down. Now, get out again."

SCORE: Opens door and gets in and out in any fashion. Examiner may score Item 8.3.

8.3 ENTERS AND LEAVES CAR INDEPENDENTLY IN MANNER RECOMMENDED FOR MAXIMUM SAFETY.

PROCEDURE: Use procedure for Item 8.2

SCORE: Opens door; places one hand on inside door handle, the other on top of door jamb. Reverses technique in getting out.

APPENDIX E

PART III - AGE NORMS FOR THE TWENTY-FOUR ITEMS IN THE SHORT FORM

Items	Age Groups				
	3-4	5-6	7-8	9-10	11-12
Directions and Turns					
1.(8.2)	>10%	>75%	>90%		
2.(8.3)	< 10%	>25%	> 50%	>50%	> 75%
3.(22.1)	<10%	<10%	<10%	>25%	> 25%
4.(22.3)	<10%	<10%	<10%	>25%	> 25%
Movement in Space					
5.(4.5)	>50%	>50%	>50%	>25%	> 25%
6.(4.6)	>25%	>25%	> 25%	>25%	> 10%
7.(23.4)	>25%	>50%	>75%	>75%	> 75%
8.(23.5)	>10%	> 25%	> 50%	>50%	> 75%
9.(24.1)	>10%	>50%	> 75%	>90%	
10.(24.2)	>10%	> 25%	> 75%	>75%	> 90%
11.(24.3)	>10%	> 25%	> 50%	>50%	> 50%
12.(24.4)	< 10%	>25%	> 50%	>50%	> 50%
13.(25.4)	<10%	> 25%	> 25%	>25%	> 25%
14.(26.3)	>10%	>50%	> 75%	>90%	> 75%
15.(26.4)	>25%	>50%	> 50%	>75%	>75%
Self Help					
16.(7.5)	<10%	>25%	> 50%	>50%	>75%
17.(7.7)	<10%	> 10%	> 25%	>50%	>75%
18.(10.2)	<10%	>50%	> 75%	>90%	
19.(10.3)	>10%	>50%	> 75%	>90%	
20.(10.4)	<10%	>25%	> 50%	>75%	>90%
21.(10.5)	<10%	> 25%	> 50%	>75%	>75%
22.(13.4)	<10%	<10%	> 25%	>50%	>50%
23.(14.4)	>25%	>50%	> 90%	>75%	>75%
24.(14.5)	<10%	> 25%	> 25%	>50%	>50%

APPENDIX F

SUGGESTED ADDITIONAL ITEMS

Identification of common sounds which aid in travel.

Ability to move in the direction of sound source while traveling, while playing games, etc.

Using voices of others.

Ability to use house numbers for orientation.

Ability to use counting for orientation, i.e., position and sequence.

Concept of distance and ability to estimate distance during travel.

Acquaintance with common objects in the environment which may serve as landmarks.

Spatial concepts relating to size, shape, geometric patterns, "higher than", "lower than."

Postural relationships - in front of, behind, ahead of, etc.

Use of cardinal directions in travel.

Concepts of a city block - street patterns such as intersections, curbs, crosswalk, etc.

Self-help skills - eating, using drinking fountain, managing doors, etc.

Using sensory cues such as temperature, smell, air currents, etc.

Notion of relative size of common objects.

Using concept of weight.

Skills used in playing games - using sound to catch a ball, jumping rope.

APPENDIX G

Summary of Field Examiner's Notes on Specific Items

Item No.

2.2 Trails room

Failures were due to:

1. Lack of knowledge of trailing techniques.
2. Unaware of the idea of investigating an area.

3.0 Using Tactile Cues

3.1 The request to report a difference is not understood by very young children.
Perhaps matching of similar objects would remove the difficulty. i.e. "Tell me which objects are alike."

3.2 There is confusion between identifying (naming it) an object and describing the object. The items require description of an article as an indication that the subject investigated it. All materials are circular. Other shapes might be used.

4.0 Walking

Standard should vary with age.

6.1 Pinpoints dropped objects

Pointing by the hand is not a common experience with the blind. "Show me with your hand," seems to be a better expression. Perhaps "point with the nose" (looking at it) is more appropriate.
Pinpointing could well be tested as a part of 6.2 - Search Pattern.

7.3-7.4 Children had difficulties verbalizing their notions of doors and windows.

7.5 Working parts of doors

Two questions might be used here. First, "Where are the hinges?" and second, "Tell me how they work."

7.7 Uses key

It is difficult to standardize type of door and type of key. Could a portable model be used?

9.3 and 9.4 Touches body parts

Children often missed "waist." May touch shoulder, stomach, ribs.

"Chest" often missed. Large segments of body are difficult to indicate clearly.

10.5 Putting on belt
Standards should require inserting belt through loop next to buckle.

12.1 Makes complete turns
Child often turns half-way and returns same way. Try, "Turn in a circle until you face me again."
Perhaps 12.2 and 12.3 should precede 12.1.

12.4 Establishes diagonal
Instructions not always understood by the children. Experiment with other wording. Word "opposite" is difficult here. Following wording for directions may be better:
"You are standing with your back to the wall and you are facing the wall on the other side of the room. You are just as far from one corner of the wall on the other side of the room as you are from the other. Turn and walk toward either corner on the other side of the room."

13.2 Answering telephone
Some children began dialing while answering.

13.3 Places calls
While the practice of reporting that one is blind is often advocated, the Examiner believes it is unnecessary.

14.1 Locates tools
Examiner suggests the following:

1. A taller object should be inserted so exploration is more difficult. This would require a different type of hand-sweep in exploring.
2. Perhaps omit the toy (car) since children become absorbed with it.
3. Perhaps a set pattern of arrangement of the objects should be followed in placing the objects on the table.

14.2 Places tools in order
As an incidental observation the Examiner noted the inability of children to use hammer - this is a limitation which might be explored.

14.3 Returns materials
Most children succeed on the task. Since it is an important skill, more complicated tasks should be added to challenge older children.

14.4 Identifies tools
Children found it easier to name a tool than to demonstrate its use. It would be well to add a "kitchen" type tool to provide greater variety.

14.5 Using helping hand
Children seemed unfamiliar with tracing wheel. The heart-shaped pattern presented problems on top crevice. A free form pattern glued to a paper and a tracing with crayon might be advisable.

15.1 Localizes sound source
A child seemed to miss the signal in front of him when that was the initial ring. Suggest a side signal be given first. The position of the Examiner's body may be providing a variation in sounds. A buzzer system with remote control might be an effective device.

16.2 Identifies voices
and
16.3 Identifies common sounds
These two items were dropped early in the testing since all children seemed to be passing them.
Examiner believes the items are good and if more extensive testing had been done with children age 3, the items would have proved valuable.

17.6 Detects sound shadow
Instructions should state that the examiner must remain on the inside so as not to obstruct the shadow. Scoring should be modified to indicate that there is something casting a shadow. Child need not identify it as implied in the scoring.

20.1 Reverses straight line route
Suggested improvement in wording of directions:
"Walk to the door, and then turn around and walk back to the chair."

20.3 One left and one right turn
Children have difficulty keeping the chain of commands in mind in this item.
Instructions might say, "I am going to ask you to do four things. Listen while I tell you. Go through . . . to stop. Now do these four things."

20.4 Reverses route
Some children return on a diagonal rather than the route traveled. Instructions should say, "Go back to the chair exactly . . ."

25.3 Run toward person
Item presupposed that child can run without assistance. An item should be inserted to determine whether he can in fact run alone before this skill is tested.

General Suggestions for Order of

Administration of the Items

The Examiner believes the present order of administration of items required too much "jumping up" and "down." In order to avoid getting up and down so much the following order is suggested:

"Sitting"

1.1
1.2
1.3
1.4
3.1
3.2
3.5
3.6
14.1
14.2
14.3
14.4
14.5
13.1
13.2
13.3
13.4

"Sitting/Standing"

10.1
10.2
10.3
11.5
11.3
10.4
10.5
10.6
11.4
11.1
11.2
10.7
8.1
8.4
9.1
9.2
9.3

9.4
12.1
12.2
12.4
12.5
6.1
6.2
6.3
6.4
15.1

"Around the room"

2.1
2.2
2.3
2.4
2.5
5.1
4.1
4.2
4.3
4.4
4.5
4.6
5.2
5.3
5.4
5.5
7.1

7.3
7.5
7.7
8.1
8.2
8.3
through
20.1
20.2
20.3
20.4

7.2
7.4
7.6
12.3
3.4
3.3

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15. ABSTRACT *(250 words max.)*

The first stage of this project dealt with the identification of orientation and mobility skills which are essential for young blind children. A master list of skills was compiled from developmental studies and from observations made by experienced teachers of blind children. These skills formed the basis for constructing a scale comprised of 47 subscales, each of which had 3 or more items arranged in developmental order. The initial scaling of the items was done by jury judgment and by full trial with children.

The second stage of the project dealt with the refinement of the scale and the establishment of norms. The Experimental Edition was reduced to 26 subscales which related to self-help in travel, formal orientation and mobility pre-cane skills, movement in space, use of sensory cues in travel and directions and turns.

A test-retest procedure using 41 subjects was employed to test the reliability. Norming data were collected on 173 subjects, ages 3-12, who were representative of elementary age blind children in the United States. All subjects were either blind or possessed light perception only. All subjects possessed intelligence in the normal range and were free from physical disabilities which may interfere with orientation and mobility.

Twenty-four items which possessed an acceptable range of difficulty (20-80%) and a high reliability (.91 for entire form) were used to construct a Short Form. The remaining promising items were used to construct the two following instruments: Instructional Tasks in Orientation and Mobility for Young Blind Children (34 items) and Pre-cane Orientation and Mobility Skills (25 items).

16. RETRIEVAL TERMS *(Continue on reverse)*

Orientation of the blind.
Mobility of the blind.
Travel skills of the blind.
Travel training for the blind.
Peripatology
Foot travel of the blind.
Pre-cane travel of the blind.

17. IDENTIFIERS